

Regional transport targets for sustainable transportation in New Zealand

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Key words: measurement, monitoring, projections, public transport, regional targets, single occupancy vehicle, transport targets, travel demand management, walking and cycling trips

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Foreword

This study was commissioned in 2008 to support the publication of the *Government policy statement on land transport funding* (August 2008 edition) (GPS). This document contained targets, expressed at a national level, which set out what the government wanted to achieve for transport over a six to 10-year period.

The study aimed to 'regionalise' these national targets. By considering the specific circumstances in each of the regions, and using regional modelling, it sought to determine an appropriate contribution by each region to the national targets, recognising that some regions are much better placed to achieve against some targets than others. For example, mode shift to public transport is likely to be much more readily achieved in an urban region than in one that is more rural.

The NZ Transport Strategy (NZTS), published in 2008, also contains longer term (30-year targets). The study was also intended to provide advice on how the NZTS targets might be regionalised in the future. This information would be important for regions as they each developed their first 30-year regional land transport strategies, which under the Land Transport Management Act must contain targets.

A replacement GPS was issued in May 2009. This document expresses the outcomes sought by government in the form of a series of impacts, focused in particular on economic growth and productivity, but does not contain targets. This removed one of the main objectives of the study – to regionalise the targets in the GPS. The results of the study, set out in this report, should be considered against this background.

Nonetheless, the focus of the study on working at the regional level to establish the transport outcomes each region might be able to achieve in the future remains valid.

Acknowledgements

The authors gratefully acknowledge the financial assistance provided by the NZ Transport Agency without which this research project could not have been undertaken. We thank the regional councils, particularly staff in the 'big 3' (Auckland, Wellington and Christchurch), who provided time, in meetings, workshops and on the end of the phone, as well as hard data and reports, so that we could pull this report together. David Wanty, MWH, also provided valuable comments and clarifications in his peer review of the report.

We would also like to recognise the individuals within these and other organisations whose comments helped us to develop the output from this project to ensure its usefulness to them.

Abbreviations and acronyms

AMR	Annual monitoring report	NZHTS 1997/98,	New Zealand Household Travel Survey 1997/98
ARLTS	Auckland Regional Land Transport Strategy	ONZHTS 2004-07	Ongoing New Zealand Household Travel Survey spanning the years 2003/4, 2004/5, 2005/6, 2006/7
ARPES	Auckland Road Pricing Evaluation Study	pa	per annum
ARTA	Auckland Regional Transport Authority	PT	Public transport
ATSAP	Auckland Transport Strategic Alignment Project	PTAG	Public Transport Advisory Group
BAU	Business as usual	PTP	Personalised travel planning
CAGR	Compared annual growth rate	RCs	Regional councils
EEM2	NZTA's <i>Economic evaluation manual</i> , vol 2	RLTS	Regional land transport strategy
ES	Executive summary	RPTP	Regional passenger transport plan
GPS	Government policy statement	SCG	Super Gold Card
HOV	High occupancy vehicles	SOV	Single occupancy vehicle
ICT	Information communication technology	SOV KT	Single occupancy vehicle – kilometres travelled
IWA	Ian Wallis Associates	SRM	Strategy review model
JOG	Joint Officials Group on Auckland Transport	STP	School travel plans
JTW	Journey to work	TDM	Travel demand management
KT	Kilometres travelled	TM	Total mobility
LOS	Level of service	VKT	Vehicle kilometres travelled
LTCCP	Long-term council community plan	VFEM	Vehicle fleet emissions model (managed by MoT)
LTP	Land transport programme	W/C	Walking/cycling
MoE	Ministry of Education	WPTP	Workplace travel plans
MoT	Ministry of Transport	WSBs	Walking school buses
MUA	Main urban areas		
NZTA	New Zealand Transport Agency		
NZTS	New Zealand Transport Strategy		

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List of main urban areas

Region	MUAs
Northland	Whangarei
Auckland	North Shore Waitakere Auckland Manukau
Waikato	Hamilton
Bay of Plenty	Tauranga Rotorua
Gisborne	Gisborne
Taranaki	New Plymouth
Manawatu-Wanganui	Wanganui Palmerston North
Wellington	Kapiti Wellington Upper Hutt Lower Hutt Porirua
Tasman	No MUA
Nelson	Nelson
Marlborough	No MUA
Canterbury	Christchurch
West Coast	No MUA
Otago	Dunedin
Southland	Invercargill

Executive summary

Context

In early 2008, Ian Wallis Associates (IWA), together with Pinnacle Research & Policy Ltd (Carolyn O'Fallon) and Transport Futures Consultancy (Don Wignall), were contracted by Land Transport NZ, now the NZ Transport Agency (NZTA) to develop regional-based targets for sustainable transport in the New Zealand situation. Originally, the regional targets were to be based on the government's (then) draft of the updated NZ Transport Strategy 2008¹ which set out a number of sustainable development targets relevant to the New Zealand land transport sector and covering the period up to 2040. Subsequently, the focus was shifted to devising regional targets for the national level targets set out in the first *Government policy statement on land transport funding* (GPS), which was released in August 2008.

The GPS was subsequently amended in May 2009 by a new incoming government and the targets replaced by key impacts with economic growth and productivity as the primary objective for land transport planning and funding.

The original GPS contained targets which were directly shaped from the NZ Transport Strategy 2008 and were designed to be short- to medium-term targets that the transport sector would achieve by 2015. The GPS set out six specific targets:

- 1 Reduce kilometres travelled by single occupancy vehicles, in major urban areas on weekdays, by 10% per capita
- 2 Increase patronage on public transport by 3% per year through to 2014/15
- 3 Increase the number of walking and cycling trips by 1% per year through to 2014/15
- 4 Increase the mode share of transporting freight by coastal shipping and rail
- 5 No overall deterioration in travel times and reliability on critical routes
- 6 Reduce fatalities and hospitalisations from road crashes.

Only the first three of these targets (reducing single occupancy vehicle kilometres travelled, increasing public transport patronage, and increasing walking and cycling trips) were 'regionalised' in this project. The remainder were set aside with the agreement of the Ministry of Transport, NZTA and regional councils.

Regionalised public transport target

The 2008 GPS set a national target for public transport to increase patronage by 3% per annum by 2014/15. Based on an analysis of underlying trends (between 2000 and 2008) and proposed actions/initiatives in most regions, we estimated in table ES1 that the patronage growth for 2015/16 would exceed the 2008 GPS target.

¹ www.transport.govt.nz/ourwork/Documents/NZTS2008.pdf

Table ES1 Regionalised public transport patronage targets

Region	Current/historic patronage	Target patronage	
	07/08 trips	15/16 trips	07/08-15/16
	Total trips (millions per annum)	Total trips (millions per annum)	Total trips % per annum growth
Auckland	54.34	85.00	6%
Wellington	34.69	42.19	2%
Christchurch	16.65	25.00	5%
Waikato	3.65	8.65	11%
Bay of Plenty	1.56	2.74	7%
Manawatu – Wanganui	1.06	1.50	4%
Hawke’s Bay	0.54	0.76	5%
Southland	0.42	0.48	1%
Taranaki	0.35	0.41	2%
Nelson/Tasman	0.30	0.47	6%
Otago – Wakatipu	n/a	3.22	n/a
Otago – Dunedin	2.21	3.22	5%
Northland	0.25	0.31	3%
Timaru	0.19	0.22	2%
Gisborne	0.12	0.14	2%
West Coast	0.02	0.02	2%
Marlborough	n/a		
Total all	116.35	174.32	5%
GPS national target	116.35	145.52	3%

Regionalised single occupancy vehicle kilometres travelled (SOV KT) target

The 2008 GPS set a national target to reduce SOV KT/capita in major urban areas² on weekdays by 10% by 2014/15. As is shown in table ES2, we developed two potential scenarios, based on underlying trends and involving the implementation of various travel demand management (TDM) initiatives (both priced and non-priced) for each region that had one or more main urban area within its boundaries. Table ES2 reveals that regions may have difficulty meeting the regionalised target unless some reasonable substantial priced- and non-priced TDM measures are put in place, particularly if the indicated underlying trend is for a zero change in SOV KT per capita per year.

² ‘Major urban areas’ were subsequently defined using the Statistics New Zealand definition for ‘main urban area’, ie an urban area with a population greater than 30,000.

Table ES2 Single occupancy vehicle kilometres travelled regional targets

Region	2004/07	2015/16			
	Baseline	TARGET SOV KT ^(a)		Scenario (√ = target achieved; X = target not achieved)	
	Total million km travelled by residents per year	10% reduction in annual km per resident by 2015	Impact of priced and non-priced TDM measures	1 ^(b)	2 ^(c)
Northland	111.59	2211.02	2.0%	X	√
Auckland	4147.97	2978.59	9.0%	X	√
Waikato	616.01	3206.78	7.0%	X	√
Bay of Plenty	334.77	2212.02	7.0%	X	√
Gisborne	72.95	2126.47	2.0%	X	√
Hawke's Bay	277.20	2126.47	2.0%	X	√
Taranaki	269.91	2126.47	2.0%	X	√
Manawatu – Wanganui	109.42	2126.47	4.0%	X	√
Wellington	1407.98	3113.28	8.0%	X	√
Tasman	n/a				
Nelson	165.63	2537.58	4.0%	X	√
Marlborough	n/a				
Canterbury	838.09	2147.41	7.0%	X	√
West Coast	n/a				
Otago	317.09	2463.89	4.0%	X	√
Southland	135.51	2537.58	2.0%	X	√
Total	8804.12	2734.66			

^(a) Due to small sample sizes within the ONZHTS dataset for some regional MUAs, we had to combine these areas to derive the VKT per resident per year and the SOV KT targets.

^(b) Scenario 1: Assume underlying trend: zero-change in SOV KT/capita/year (pre-interventions)

^(c) Scenario 2: Assume underlying trend: 5% decline in SOV KT per person in total by 2015/16; measures have same impact as scenario 1

Regionalised walking/cycling target

The GPS 2008 set a national target to increase the number of walking and cycling trips by 1% per year through to 2014/15. As is shown in table ES3, we developed two potential scenarios, based on underlying trends and which involved implementing varying combinations of non-priced TDM initiatives for each region. Non-priced TDM measures include initiatives such as personalised, school and workplace travel planning; guaranteed ride home schemes; intensification; and developing pedestrian and cycling networks. If the projected outcome (millions of trips per annum) is within 5% of the target outcome, we consider the 'target achieved' in table ES3. It appears that regions may have difficulty meeting the

regionalised target, particularly if the indicated underlying trend is for a 5% decline in walk/cycling trips per person in total by 2015/16.

Table ES3 Walking and cycling regional targets

Region	2004-07	2015/16			
	Baseline	TARGET W/C		Scenario (√ = target achieved; X = target not achieved)	
	Million trips travelled by residents	9.4% increase in w/c trips by 2015/16 (1% per year)	Impact of non-priced TDM measures	1 ^(a)	2 ^(b)
Northland	40.0	43.72	2%	√	X
Auckland	375.0	409.88	5%	√	√
Waikato	76.0	83.07	2%	√	X
Bay of Plenty	44.00	48.09	2%	√	X
Gisborne/Hawke's Bay	43.00	47.00	2%	√	X
Taranaki	24.0	26.23	2%	√	X
Manawatu - Wanganui	48.0	52.46	2%	X	X
Wellington	183.0	200.02	4%	√	X
Nelson - Tasman - Marlborough	45.0	49.19	2%	√	X
Canterbury	186.0	203.30	2%	√	X
West Coast	11.0	12.02	4%	X	X
Otago	67.0	73.23	2%	X	X
Southland	21.0	22.95	2%	X	X
Total	1163.0	1271.16			

^(a) Scenario 1: Assume underlying trend: zero change in walk/cycle trips/capita/year (pre-interventions); various TDM measures have impact given in table

^(b) Scenario 2: Assume underlying trend: 5% decline in walk/cycle trips per person in total by 2015/16; measures have same impact as scenario 1

Monitoring and measurement issues

The original Request for Proposal stipulated that the project report discuss 'How the regional targets could be monitored and progress tracked over time'; and make recommendations on 'which [targets] at national and regional level have existing monitoring regimes that will allow progress to be monitored, and which require additional data gathering frameworks to be established'. Our discussion focuses on monitoring the achievement of the target, as opposed to monitoring the impacts of specific programmes or initiatives.

We used existing datasets for developing the regionalised targets presented here, namely:

- Public transport (PT) boarding data collected by the NZTA from regional councils as part of its annual reporting

- SOV KT and walking/cycling data were drawn from the NZHTS 1997/98 and ONZHTS 2004-07. Indicators and trends can be reported on an annual basis (as a four-year rolling average) for most regions.

We explored other sources (eg census journey-to-work data and pedestrian or cyclist counts), but our conclusion was that existing sources, with some improvements, would prove to be the most reliable.

These sources do have weaknesses for which we have suggested improvements:

- PT boarding data is inconsistently reported and routinely does not include commercial services. We recommend that the NZTA develop structures to address this.
- ONZHTS has insufficient sample sizes to monitor regions individually. The expanded sample size (4600 per year effective in 2008/09) will address this issue for some regions, but not all.
- Walking and (especially) cycling are relatively uncommon, so that margins of error are very wide, making it difficult to confidently establish trends. We suggested the use of alternative indicators for cycling.

Abstract

In early 2008, Ian Wallis Associates, together with Pinnacle Research & Policy Ltd (Carolyn O'Fallon) and Transport Futures Consultancy (Don Wignall), were contracted by the (now) NZ Transport Agency to develop regional targets for three of the six national level targets set out in the *Government policy statement on land transport funding* (GPS), which was released in August 2008. The 2008 GPS targets were directly shaped by those in the NZ Transport Strategy 2008, and were designed to be short- to medium-term targets that the transport sector would achieve by 2015. The specific targets we regionalised were:

- reduce kilometres travelled by single occupancy vehicles, in major urban areas on weekdays, by 10% per capita
- increase patronage on public transport by 3% per year through to 2014/15
- increase the number of walking and cycling trips by 1% per year through to 2014/15.

We were also invited to assess the ability of regions to meet the regionalised targets.

In regionalising the targets, we found that the public transport patronage target should be relatively easily met by regions, while both the single occupancy vehicle and walking/cycling targets would require more effort to achieve.

1 Overview

1.1 Project context

In early 2008, Ian Wallis Associates (IWA), together with Pinnacle Research & Policy Ltd (Carolyn O'Fallon) and Transport Futures Consultancy (Don Wignall), were contracted by Land Transport NZ, now the NZ Transport Agency (NZTA), to develop regional-based targets for sustainable transport in the New Zealand situation. Originally, the regional targets were to be based on the government's (then) draft of the updated NZ Transport Strategy 2008³ which set out a number of sustainable development targets relevant to the New Zealand land transport sector and covering the period up to 2040. Subsequently, the focus was shifted to devising regional targets for the national level targets set out in the *Government policy statement on land transport funding* (GPS),⁴ which was released in August 2008.

The GPS targets were directly shaped by those in the *NZ Transport Strategy 2008*, and were designed to be short- to medium-term targets that the transport sector was to achieve by 2015. The aim of the GPS was to establish measurable targets, although this was not possible in some areas because of information gaps or pending policy work. The NZTA, with the Ministry of Transport, undertook to set regional targets taking into account the particular issues or features of the transport system in each region, with the combined total of regional targets to be equal with each associated national target within the GPS.

The GPS set out six specific targets to be achieved by 2014/15:

- 1 Reduce kilometres travelled by single occupancy vehicles, in major urban areas on weekdays, by 10% per capita
- 2 Increase patronage on public transport by 3% per year through to 2014/15
- 3 Increase the number of walking and cycling trips by 1% per year through to 2014/15
- 4 Increase the mode share of transporting freight by coastal shipping and rail
- 5 No overall deterioration in travel times and reliability on critical routes
- 6 Reduce fatalities and hospitalisations from road crashes.

Discussions and workshops were held by the consultants with key stakeholders (namely the NZTA, the Ministry of Transport and regional councils) to clarify what targets could be regionalised at this time. It was agreed that the first three targets (reducing single occupancy vehicle kilometres travelled; increasing public transport patronage; and increasing walking and cycling trips) would be 'regionalised', with the remaining three put to one side for the following reasons:

- Policies and actions to achieve the freight target were identified as being primarily the responsibility of the national level government, as regional councils had minimal authority to address how freight moves across regional boundaries.
- The Ministry of Transport, the NZTA and regional councils were to engage in a separate exercise to define 'critical routes'.

³ www.transport.govt.nz/ourwork/Documents/NZTS2008.pdf

⁴ www.transport.govt.nz/ourwork/KeyStrategies/GPSonLandTransportFunding

- The Ministry of Transport, together with other key stakeholders, had a major work programme to develop an updated road safety strategy which would include regional safety targets. The draft document was due to be released for consultation in August 2009.

1.2 Regional consultation process

Three sets of workshops/meetings were held with local authority staff, Ministry of Transport staff, and regional and head office staff of NZTA.

Invitations to the first day-long workshop in June 2008 were sent to all regional councils. Eight regional council representatives (including Hawke's Bay, Auckland Regional Council (ARC) and Auckland Regional Transport Authority (ARTA), Waikato, Christchurch, Bay of Plenty and Greater Wellington), Ministry of Transport and NZTA staff were present at the meeting. The primary purpose of the workshop was to introduce the project to the regional councils; to discuss what national targets should or could be usefully regionalised and whether to provide aspirational or achievable targets; and to consider what mechanisms (eg pricing and non-pricing initiatives) might be used to achieve the targets. Issues raised included the need to:

- clarify the definition of targets
- clearly delineate the base case
- provide separate walking and cycling targets/measures (if feasible).

The councils were keen to have strong direction from the NZTA. Some suggested that the targets should be made mandatory, as they could be useful as a funding lever.

Subsequent to the first workshop, meetings were held in Wellington (with Wellington Regional Council staff); Christchurch (with Christchurch Regional Council and Christchurch City Council staff) and Auckland (with ARC and ARTA staff) in August 2008. The main topics discussed were:

- the methodology for setting targets
- relevant data available from the local authorities
- the relationship of required targets with previous work done by local authorities
- the consultants' preliminary conclusions on the appropriate targets for each of the three authorities.

The third and final workshop, held in October 2008, was attended by staff of 11 of the 16 regional councils/unitary authorities, as well as Ministry of Transport, Local Government New Zealand, NZTA regional, and ARTA staff. The workshop basically discussed the results of the project (ie the regionalised targets), including the background to developing the regionalised targets: the target definitions, past demand trends, basis for targets, and possible policy measures that could be used to achieve the targets. Participants were invited to comment/critique the assumptions and information presented, both at the workshop and in the weeks following the workshop.

1.3 Report structure

This report sets out the regionalised targets for reducing single occupancy vehicle kilometres travelled, increasing public transport patronage, and increasing walking and cycling trips. Given the complexity of the project, it was agreed at the October 2008 workshop that the final report would be submitted as a presentation, highlighting the principal outputs and findings of the project. There are six annexes

which provide much greater detail about the outputs and findings, and serve to document the process, outside of the consultation workshops, of setting the regionalised targets:

- For all three targets: We reviewed current regional strategy policies and targets to identify the actions regional councils intended to take between 2006/07 and 2015/16. These are summarised in appendix A.
- For public transport target: We reviewed regional public transport plans and programmes, held discussions with regional public transport planners and analysed trends in public transport boardings (including impacts of service improvements) from 2000 to 2008. These are summarised in appendix B.
- For walking and cycling and single occupancy vehicle targets, we:
 - reviewed international and New Zealand experience with a range of travel demand management initiatives/programmes to determine what the likely impact would be if they were adopted in New Zealand
 - identified the underlying ‘trend’ from 2006/07 to 2015/16 for walking and cycling trips and for single occupancy vehicle kilometres travelled in the ‘base case’ or ‘business as usual’ situation (ie without the interventions required to achieve the 2008 GPS targets)
 - selected the most likely initiatives for implementation in New Zealand, creating feasible scenarios for action on a region-by-region basis, and then modelling their impact.

Appendix C discusses our methodology for assessing the impact of non-priced and priced travel demand management measures on total mode share in more detail, including establishing the ‘underlying trend’ and the base mode share or vehicle kilometres travelled in the first year of analysis. The assumptions behind our selection of travel demand management initiatives and their impact modelling are also detailed. Appendix D summarises the literature review findings and the modelling output.

- For all three targets: appendix E provides some sensitivity testing around the ‘business as usual’ or base case situation and underlying trends as well as for some of the priced and non-priced measures available.
- For all three targets: We reviewed and commented on monitoring to measure progress towards achieving the targets. These are summarised in appendix F.

2 Regionalising the 2008 GPS targets

As noted in section 1.3, it was agreed that the final report would be submitted in the format of a workshop presentation, highlighting the principal outputs and findings of the project. Hence, chapter 2 is set out as a series of Microsoft PowerPoint slides.

2.1 GPS (2008) targets for 2015/16

Targets (2015)	Notes
Increase patronage on PT by 3% pa	<ul style="list-style-type: none"> Covers 'local' PT within remit of RCs (excludes MoE school transport, long distance services, total mobility (TM))
Increase number of walking/cycling trips by 1% pa	<ul style="list-style-type: none"> Cycling not separated from walking Note definition of a trip ('leg')
Reduce single occupancy VKT/capita in major urban areas on weekdays by 10%	<ul style="list-style-type: none"> Applies to light 4-wheel vehicles (excluding business travel)
Increase freight mode share for coastal shipping and rail	<ul style="list-style-type: none"> No specific increase target at this stage – further work building on national freight strategy
No overall deterioration in travel times and reliability on critical routes	<ul style="list-style-type: none"> Critical routes to be defined – by MoT in consultation with NZTA and regions
Reduce fatalities and hospitalisations from road crashes	<ul style="list-style-type: none"> No specific reduction target at this stage – road safety strategy under review

2.1.1 GPS person travel targets – definition

TABLE: GPS (2008) PERSON TRAVEL TARGET DEFINITIONS					
GPS Target	Definitional Notes	Baseline Period	Target Period	Baseline National Statistics	Target National Statistics
<ul style="list-style-type: none"> Increase patronage on public transport by 3% pa through to 2015. 	<ul style="list-style-type: none"> Relates to 'conventional' local PT services (bus, ferry, train) under regional council regulation. Excludes long-distance services, Total Mobility, free school (MoE) bus services. Target is for 30.5% increase over 9 year period. Equates to 18.8% increase in trip legs/capita (1.9% pa) 	2006/07	2015/16	111.5 million ⁽¹⁾ trip legs pa	145.5 million trip legs pa
<ul style="list-style-type: none"> Increase number of walking and cycling trips by 1% pa through to 2015. 	<ul style="list-style-type: none"> Trips are 'trip legs' as defined in ONZHTS. Applies on a national (not MUA) basis. Target involves virtually constant walking/cycling trips/capita (population increase over period approx 1% pa). Target is for 9.4% increase over 9 year period. 	2003/04-2006/07	2012/13 – 2015/16	1125 million trip legs pa ⁽²⁾ (95% CI ±10% approx)	1230 million trip legs pa
<ul style="list-style-type: none"> Reduce single occupancy VKT in major urban areas on weekdays by 10% per capita by 2015 (compared to 2007). 	<ul style="list-style-type: none"> Relates to travel in light 4-wheel vehicles, excluding business travel, by residents of MUAs. Will require a reduction/capita against the BAU trend of significantly greater than 10%. 	2003/04-2006/07	2012/13 – 2015/16	3100 km/capita pa (95% CI ±13% approx)	2790 km/capita pa

Notes: (1) Ex NZTA statistics (amended figure).
(2) Approx 85 million trip legs (7.6%) by cycle, remainder by walk.

2.1.2 Comments on target definitions

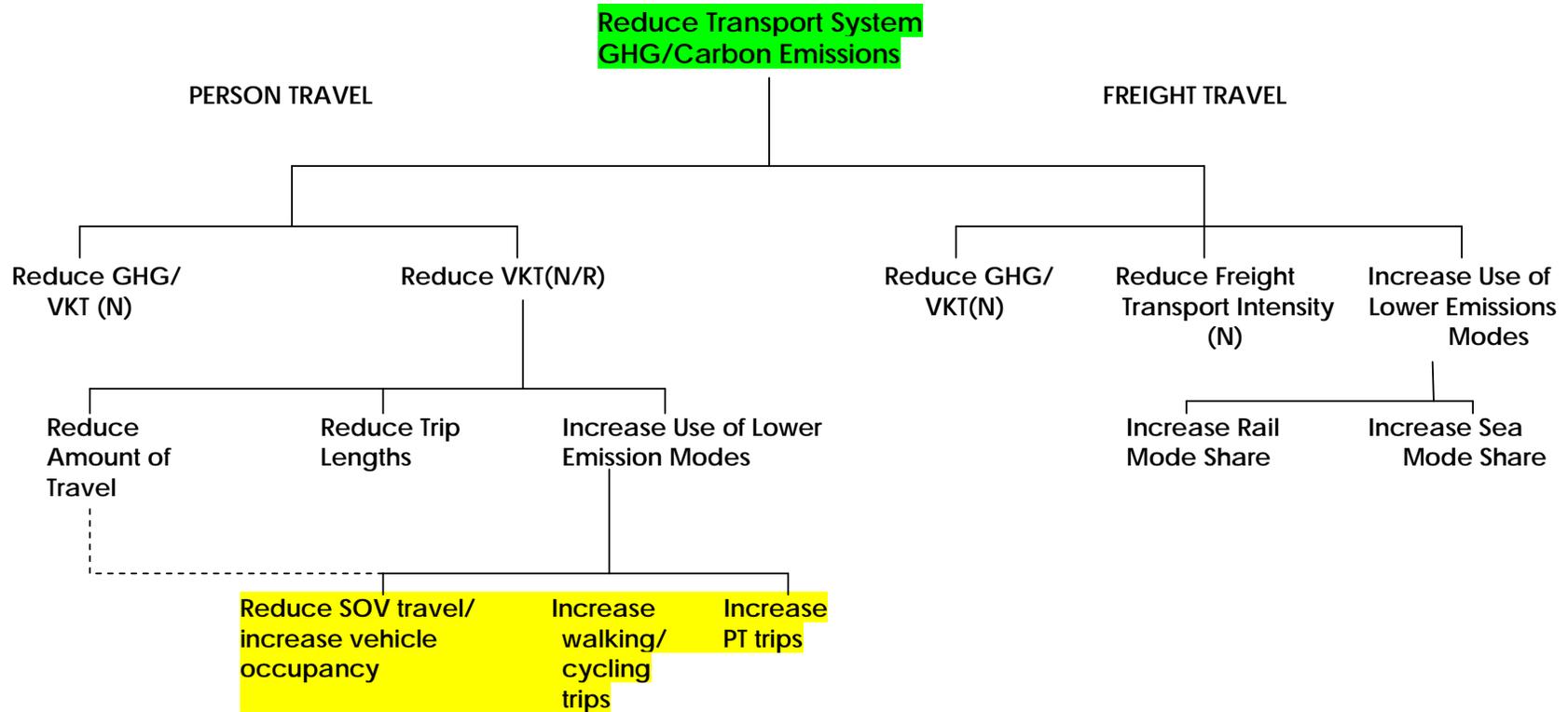
Target indicators

- **PT and W/C** targets relate to – trip ‘legs’, total, national basis
- **SOV** target relates to – trip distance (VKT), per capita, MUA basis
- Distance-related indicators likely to reflect GHG emissions better than trip ‘leg’ indicators – may give perverse results

Baseline and monitoring issues

- Need baseline period for each indicator (2006/07)
- **PT** based on national total statistics, PT boardings (NZTA database)
- **W/C & SOV** based on ONZHTS sample data
 - 2006/07 figures based on average annual figure from four-year baseline dataset (2003/04 - 2006/07)
 - statistical issues, especially at (small) regional level
 - difficulties for W/C split (refer appendix F)

2.1.3 GPS person travel targets – in context

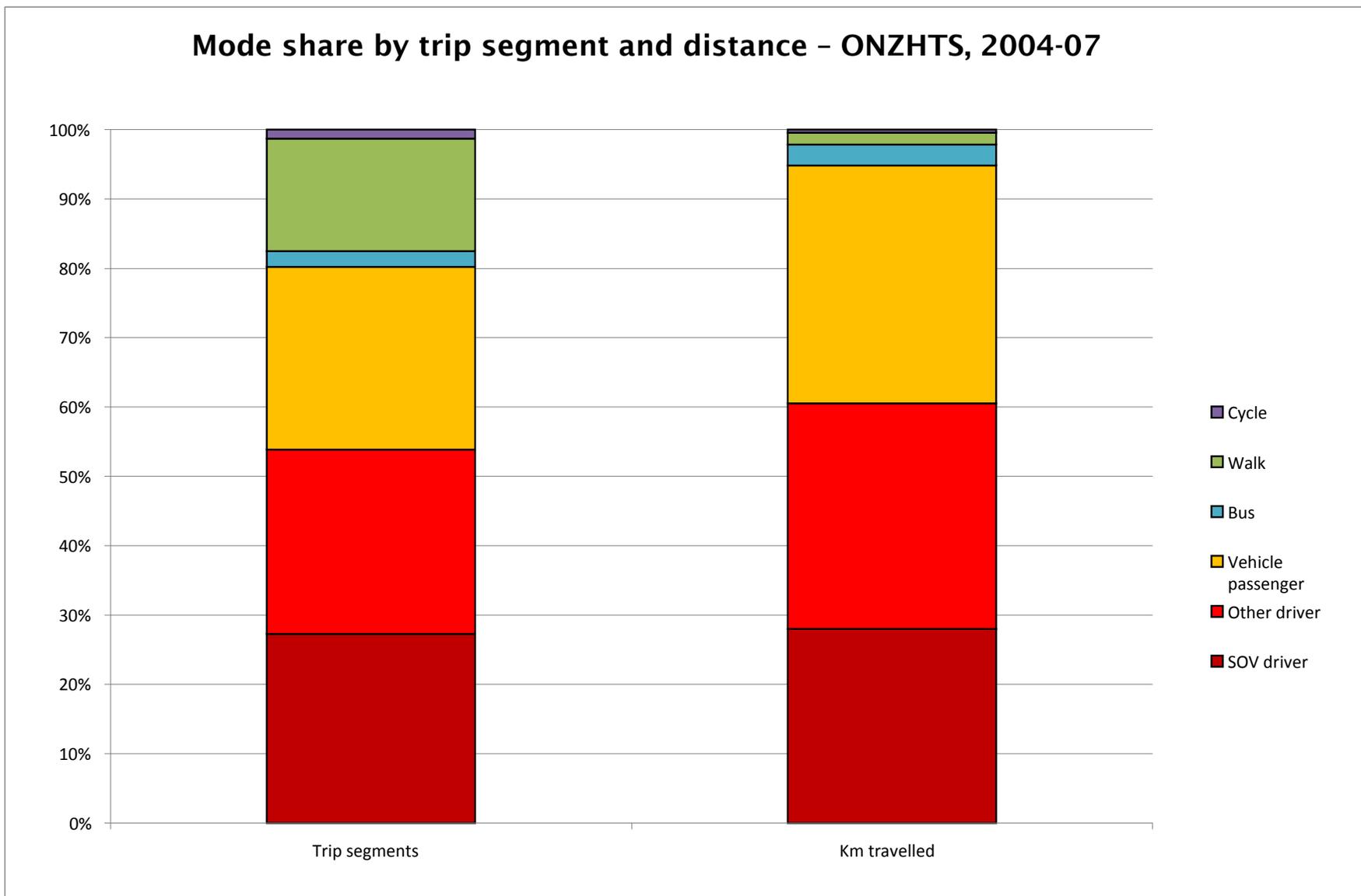


The yellow highlight shows the targets developed as part of this project and how they relate to the overall intention of the NZTS to reduce GHG/carbon emissions.

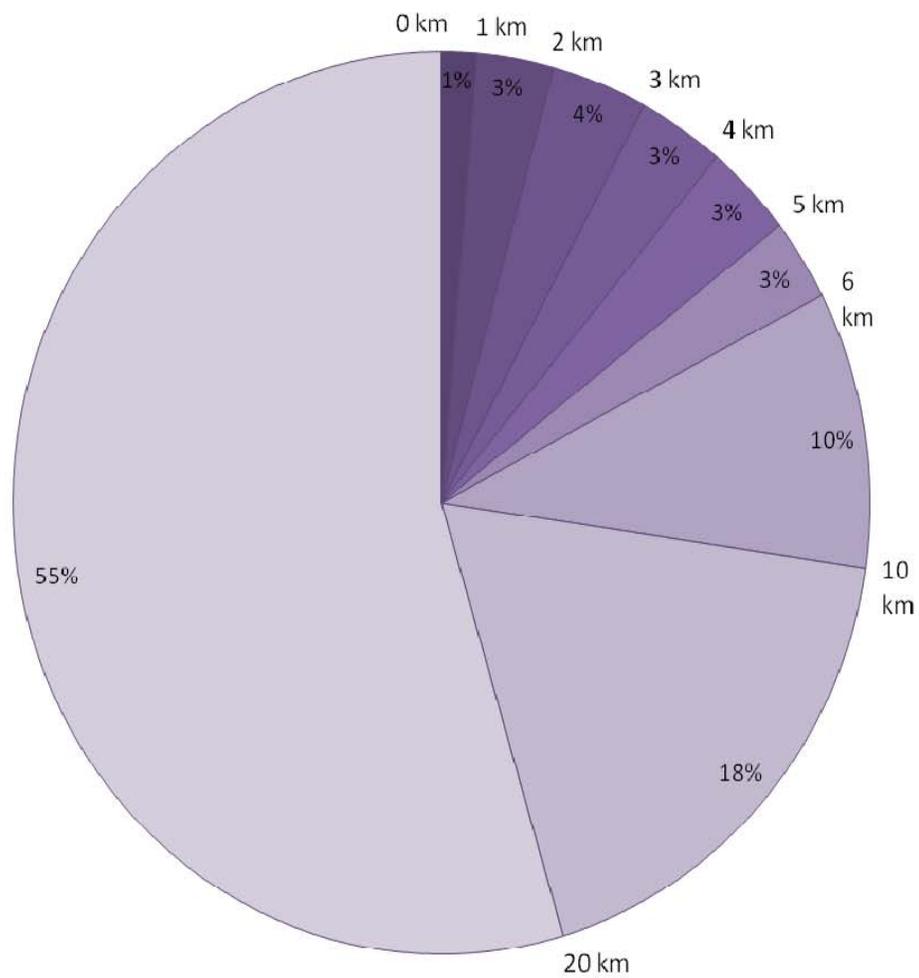
2.2 National context – travel patterns*

1. Mode share by trip segment and distance (national)
03/04–06/07
2. Total km by trip leg distance – national, MUA
3. Total distance by mode – national, MUA, other

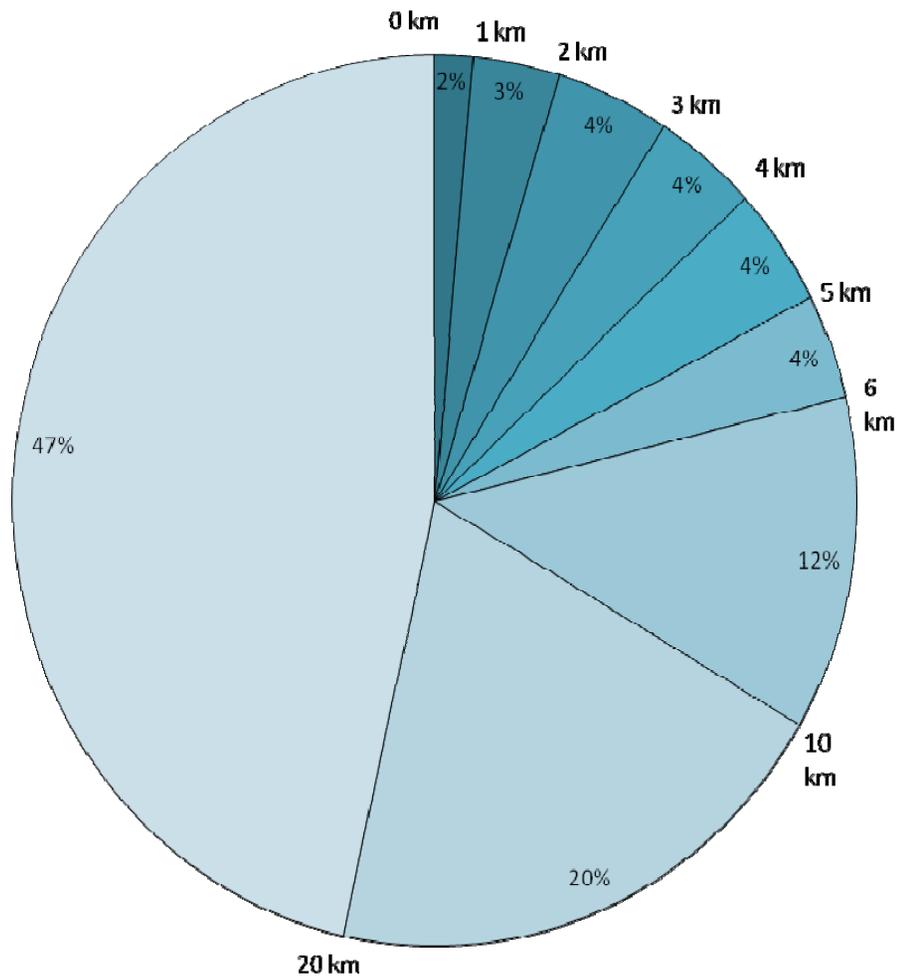
* Source: all data in this section is drawn from the Ongoing New Zealand Household Travel Survey 2004–07

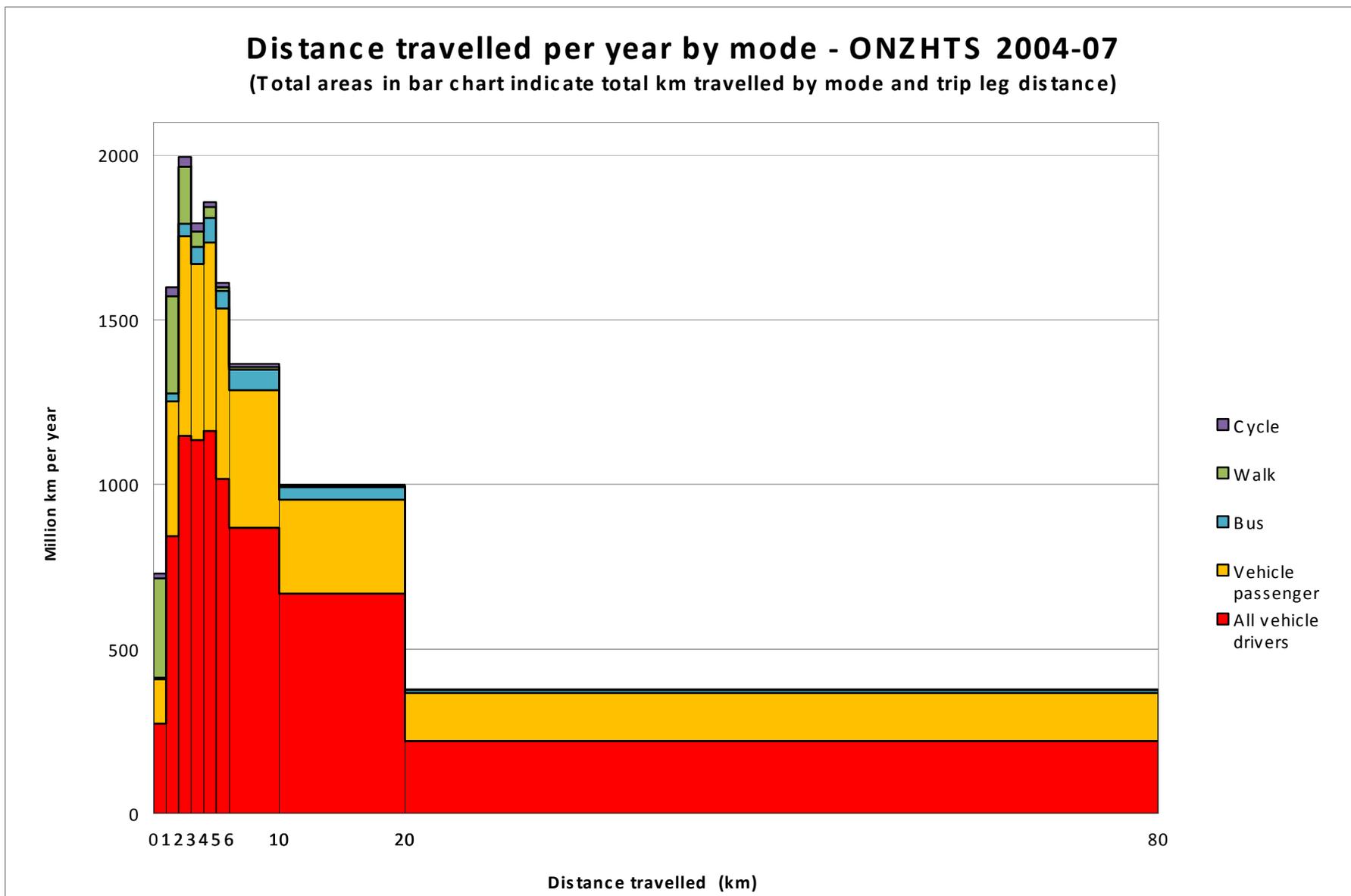


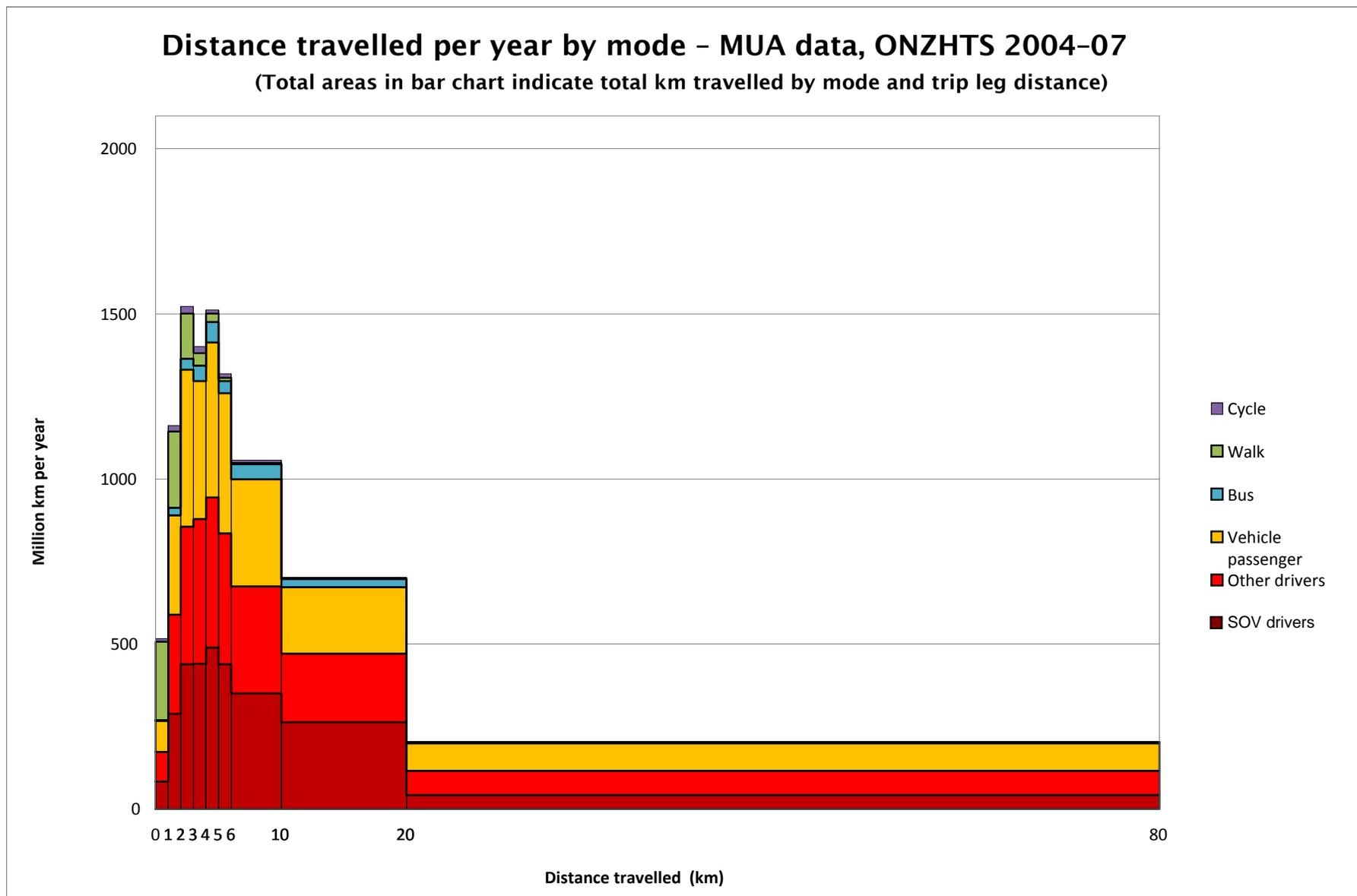
Total km travelled by trip leg distance (all New Zealand) – ONZHTS 2004-07

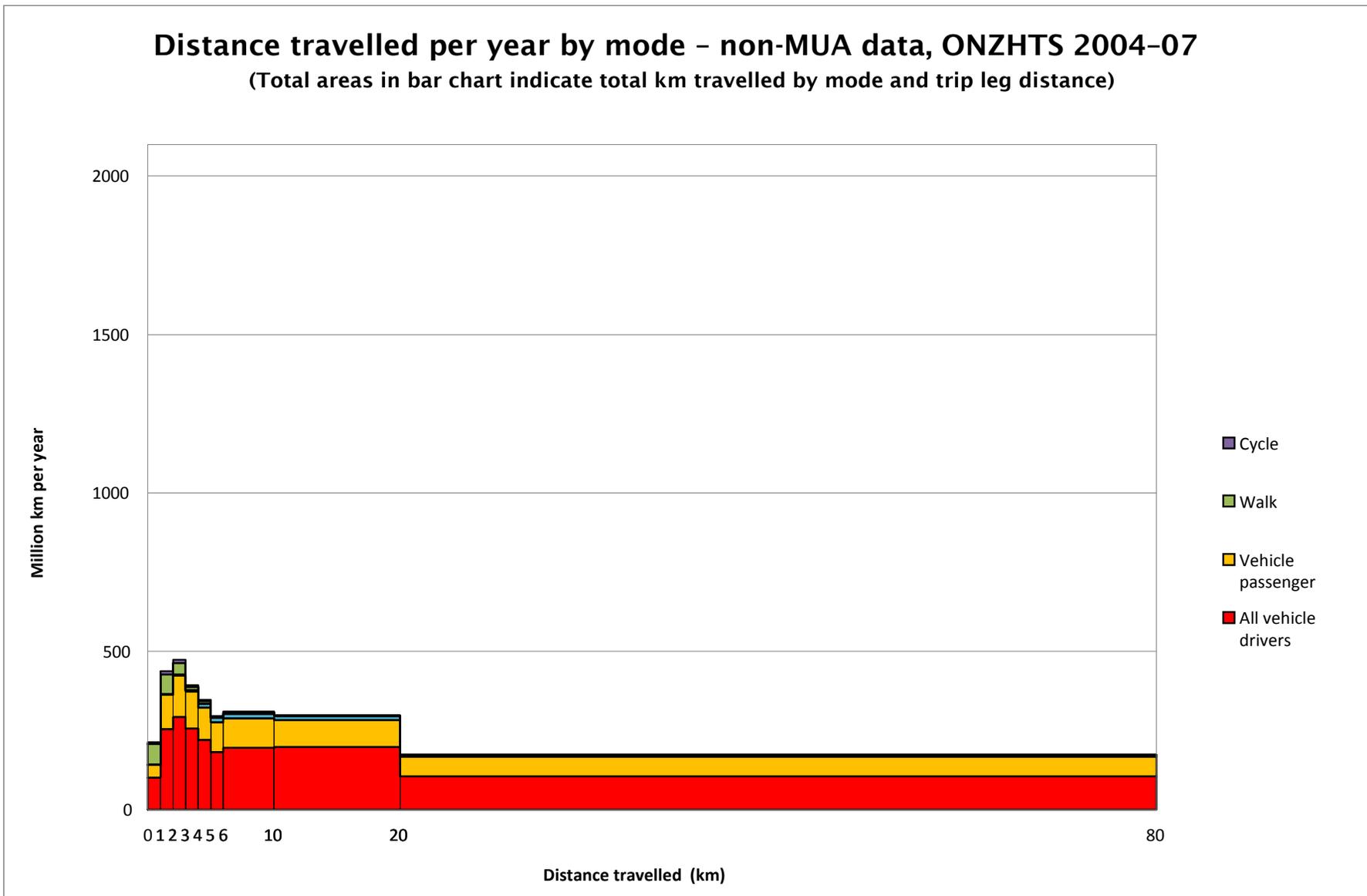


Total km travelled in MUAs by trip leg distance - ONZHTS 2004-07









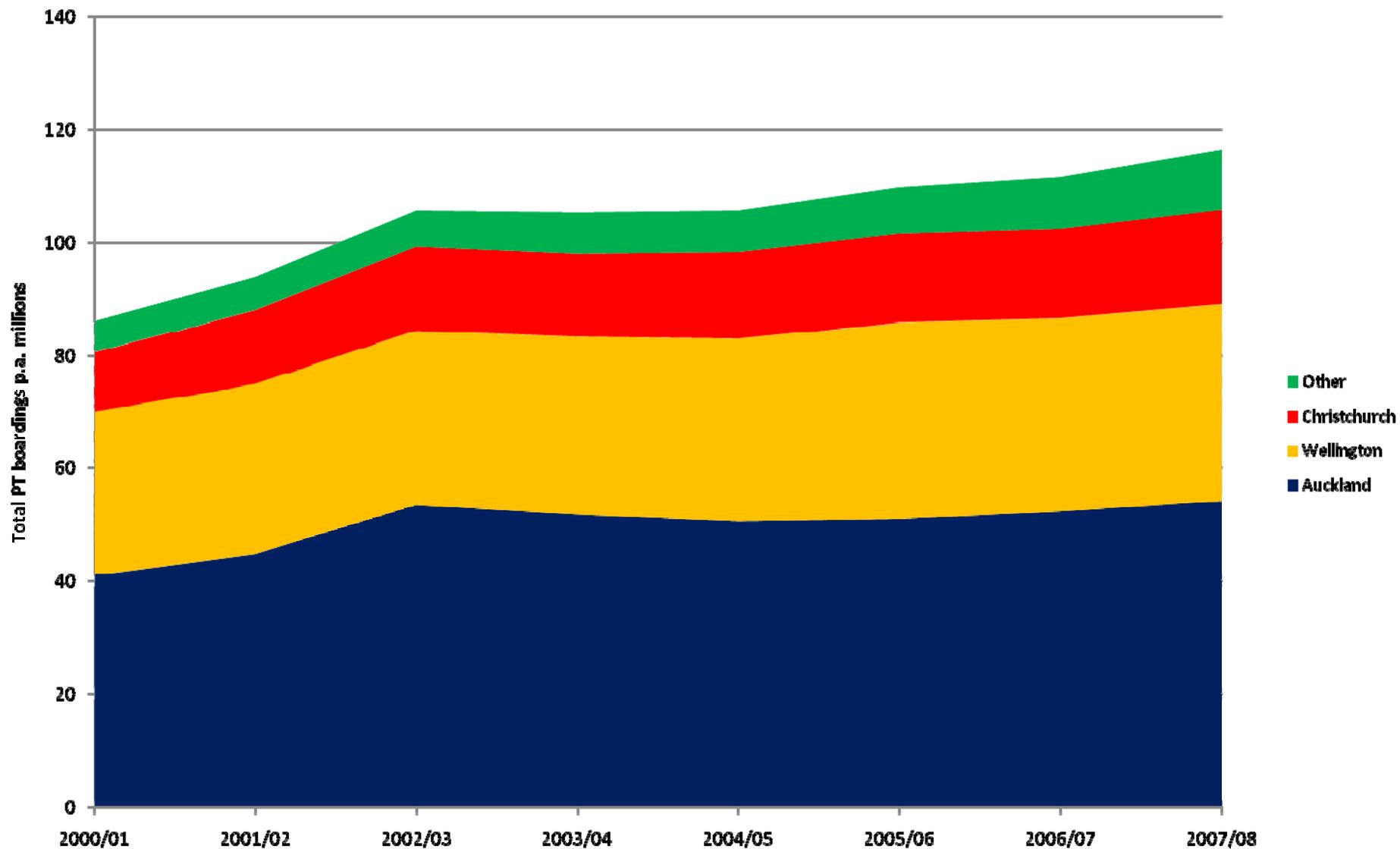
2.3 Public transport travel

2.3.1 Trends, targets and potential contributions

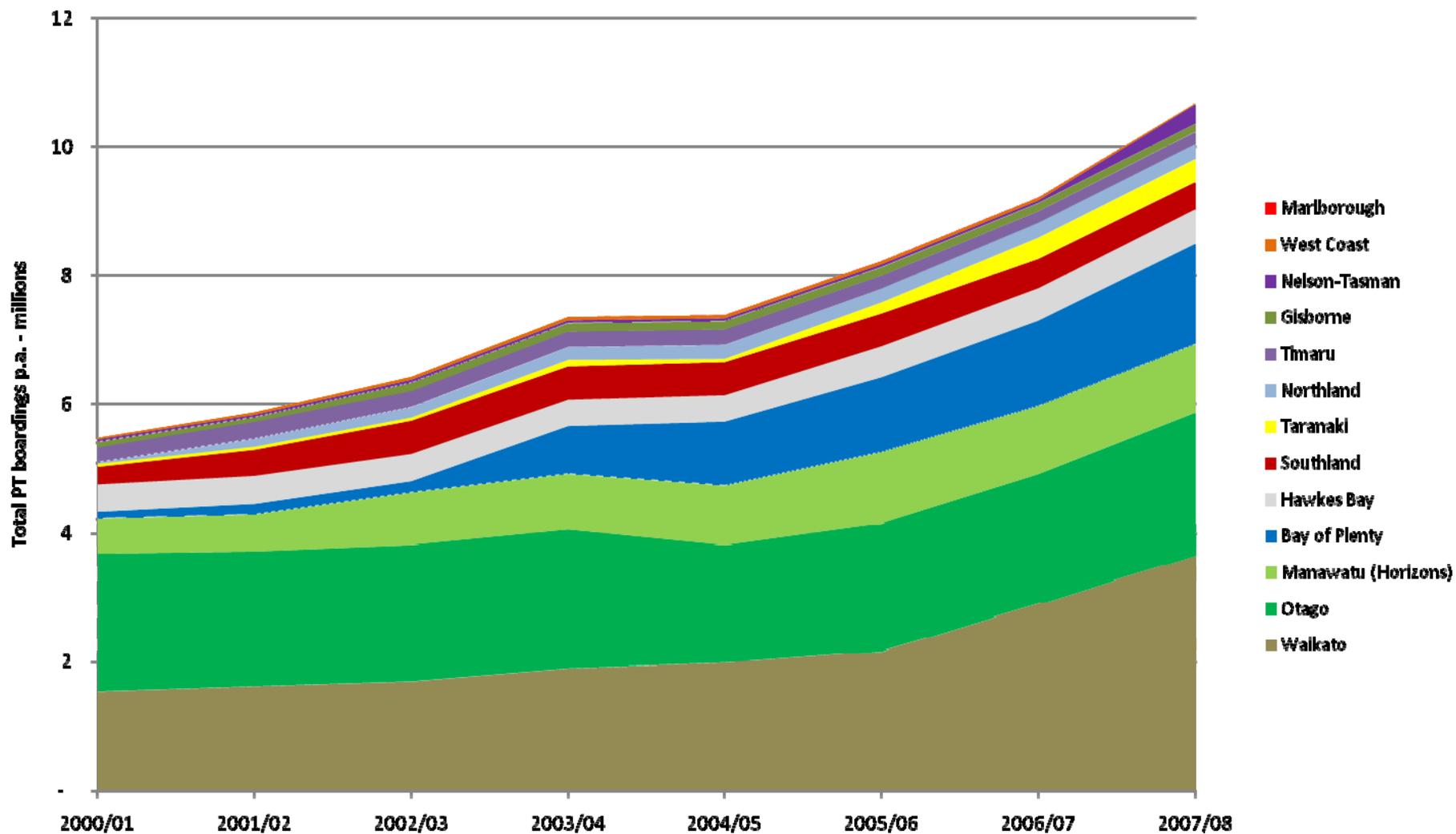
1. PT patronage current levels¹
2. PT patronage trends
3. The GPS (2008) national PT targets
4. Target-setting considerations
5. Current regional targets
6. Proposed regional targets
7. Comments and perspectives

¹ Source of PT patronage data: NZTA database

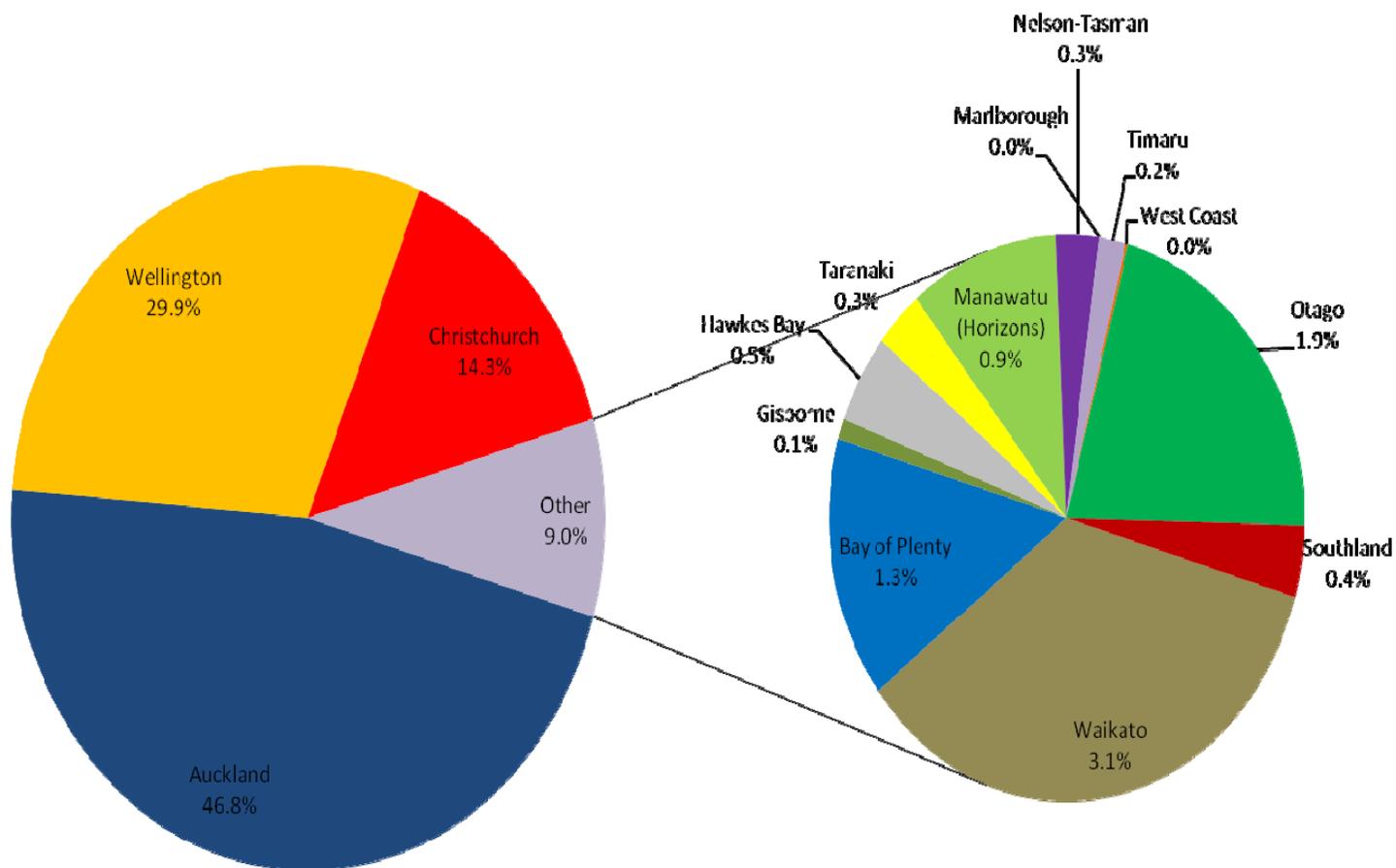
Total PT patronage trends in main urban areas, 2000/01 to 2007/08



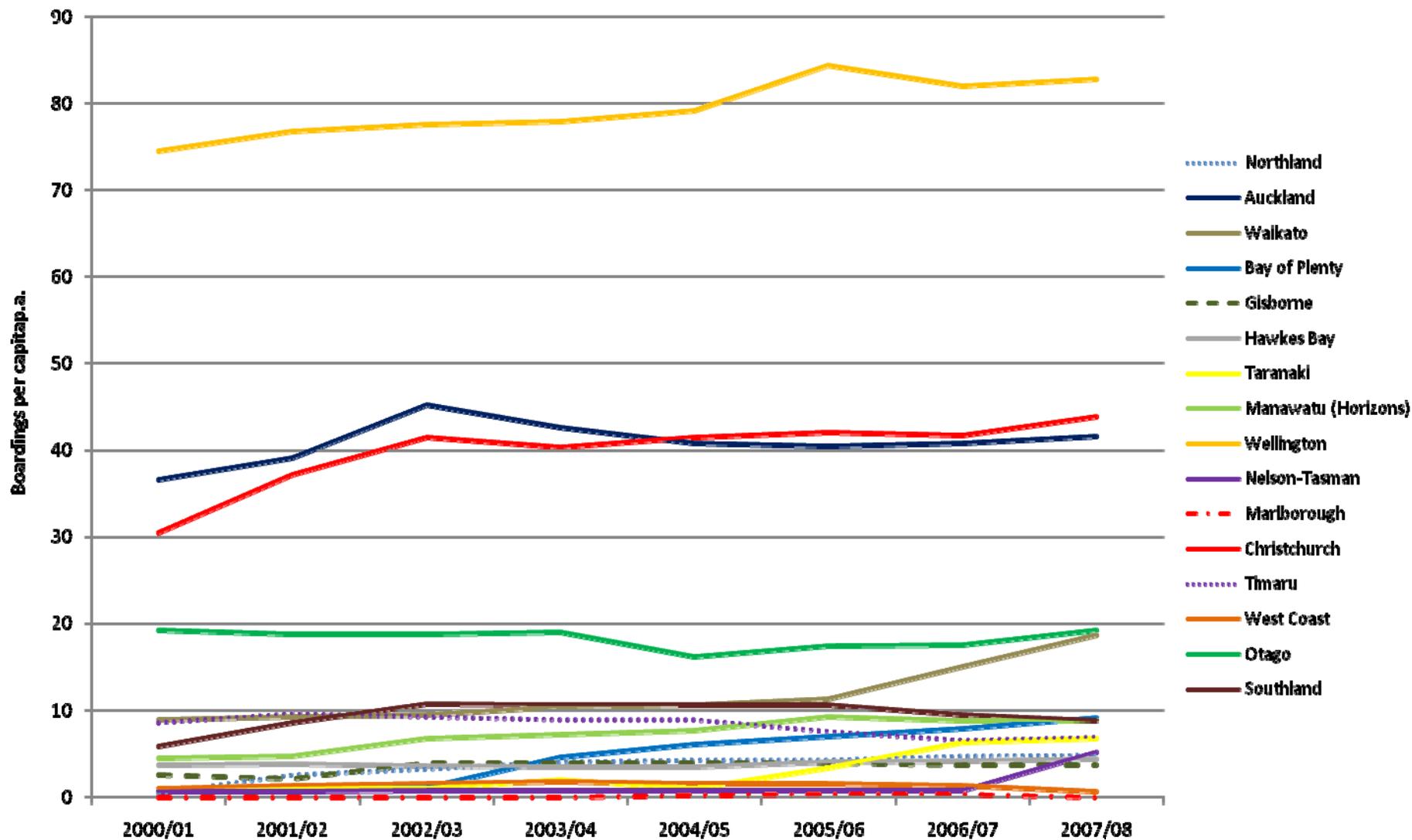
Total PT patronage trends in other urban areas, 2000/01 - 2007/08 (excludes patronage in Auckland, Wellington and Christchurch)



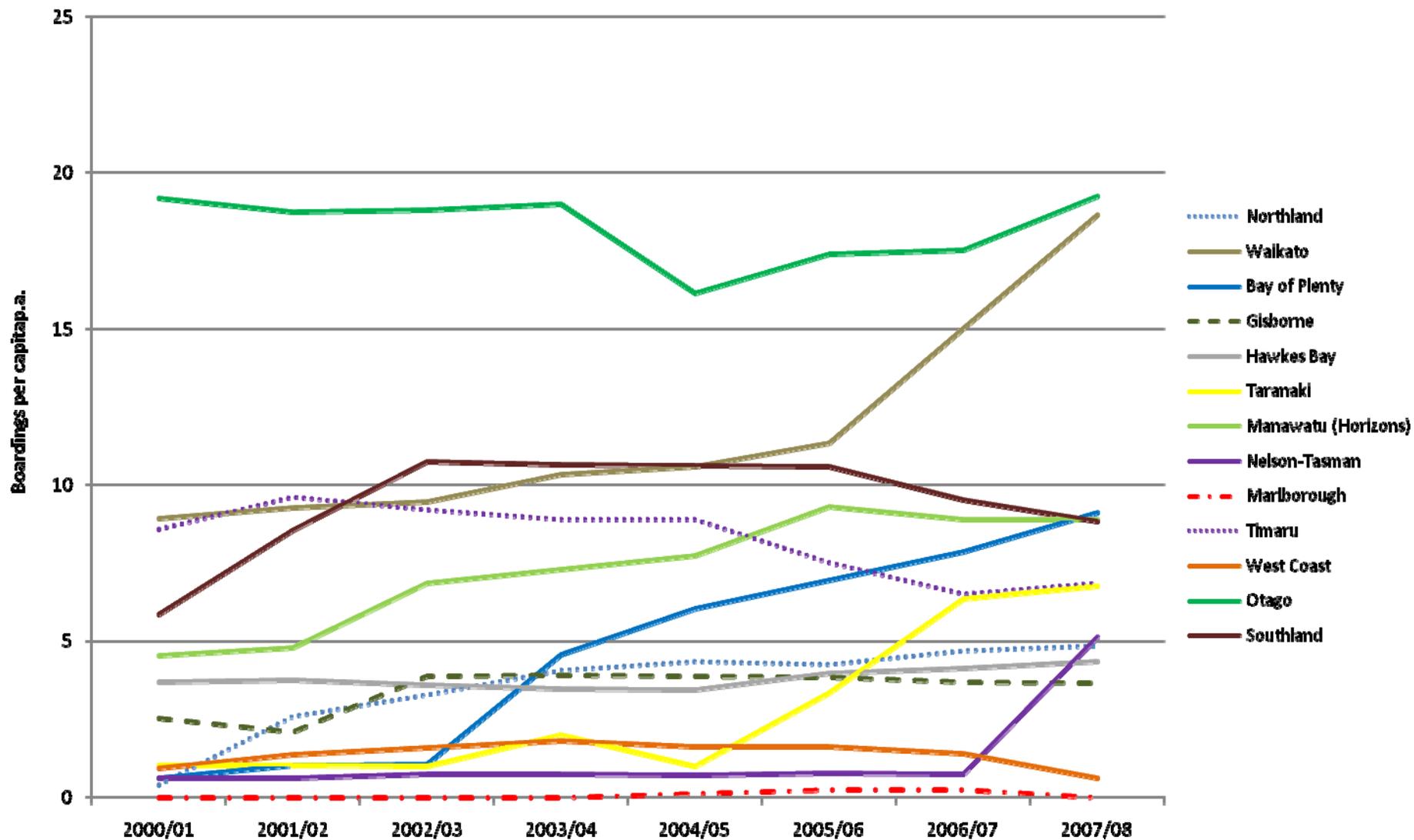
Share of total PT boardings, by city/region, 2007/08



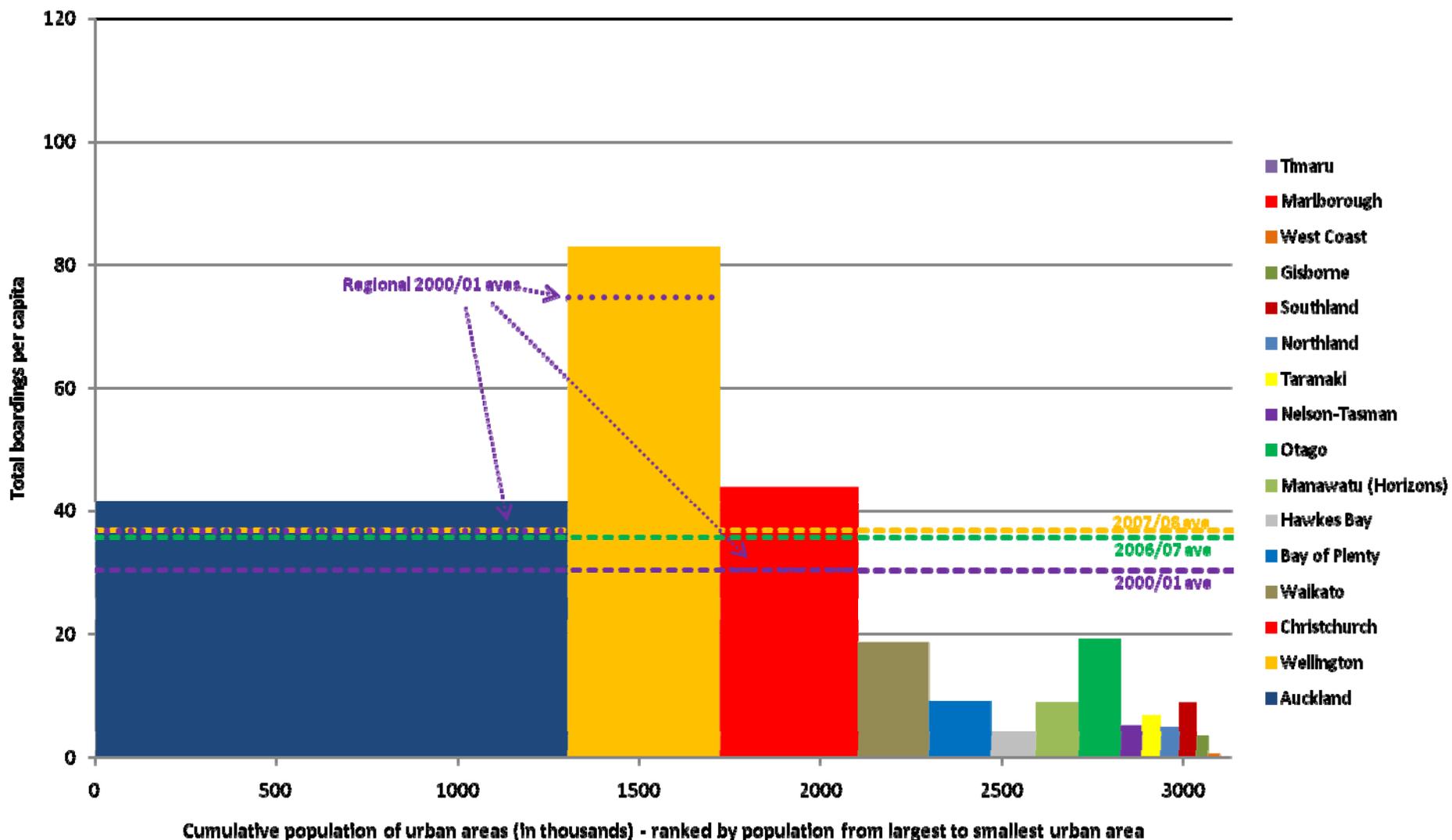
Trends in patronage per capita by urban area, 2000/01 - 2007/08



Trends in patronage per capita by urban area, 2000/01 - 2007/08



Total patronage by urban area, 2007/08 (The areas in the graph indicates total patronage within each region)



2.3.2 GPS (national) target – public transport

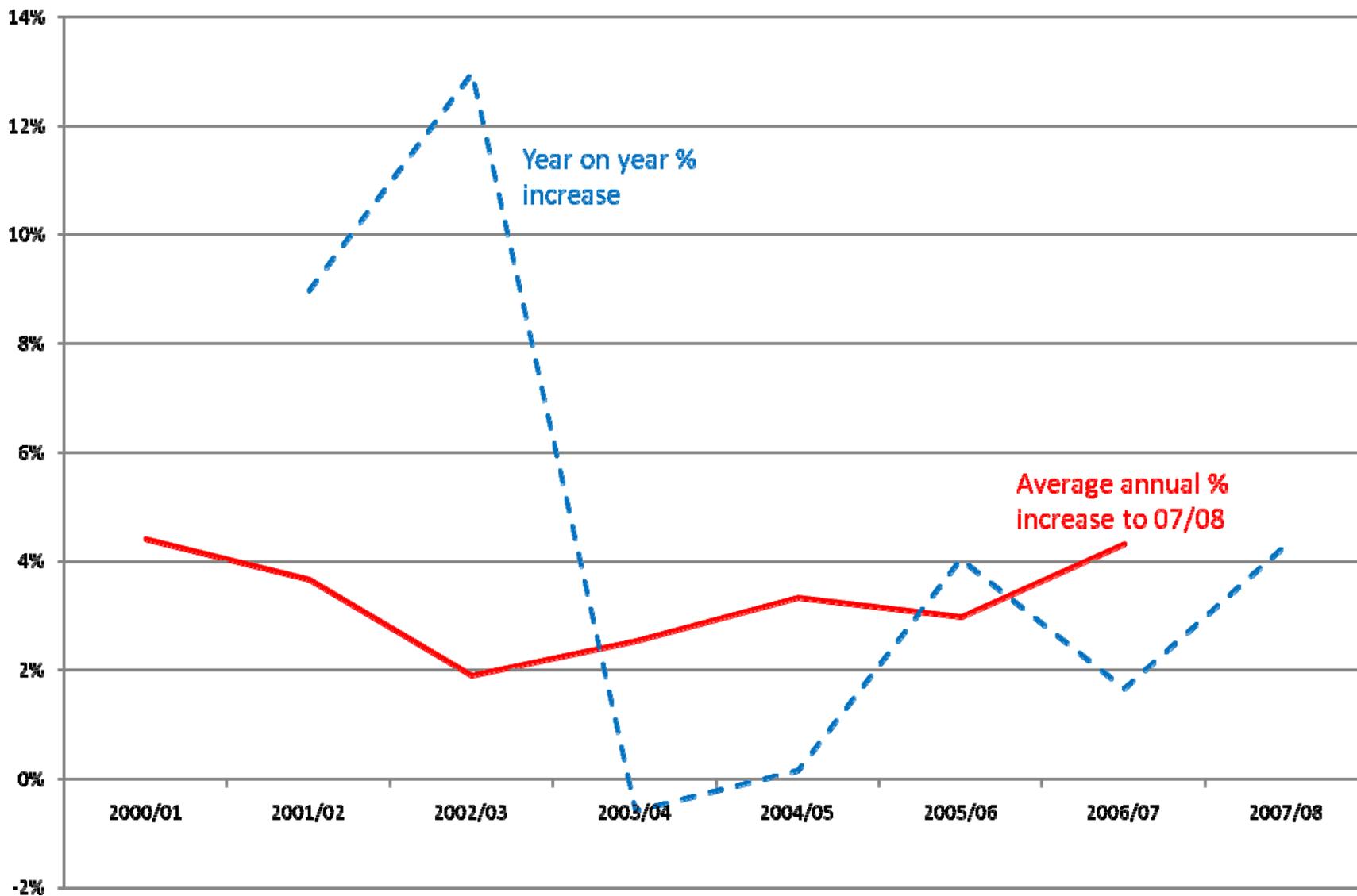
***** Increase PT patronage by 3% pa 2006/07 to 2015/16**

- Data from NZTA database (total PT boardings) – 111.5M 2006/07, 116.4M 2007/08
- Requires increase **30.5%** total over nine years from 2006/07 – to 145.5M 2015/16
- Equates to 18.8% total increase **per capita**
- Adjusting for 2007/08 growth, requires average increase/capita of 15.1% or **1.8% pa**

2.3.3 PT target-setting considerations

- Population effects separated – per capita analyses (PT catchment area)
- **Regions with current targets**
 - target status
 - time since developed
 - ‘aspirational’ v probable outcome
 - patronage trends last 5–10 years
 - policy assumptions included – PT/TDM/other
 - ‘tested’ with regional transport planners
 - tested against strategy review model (SRM)
- Focus on PT ‘carrot’ measures and other (TDM) measures to encourage PT usage – generally exclude price-related measures (fuel, RP, fares)
- **Other regions**
 - ‘default’ target per capita (1.8% pa)
 - patronage trends last 5–10 years
 - current patronage (per capita) levels
 - system ‘maturity’
 - recent policy initiatives
 - PT policy proposals, primarily PT ‘carrots’ – new areas, service levels, hours of operation, etc
 - other policy proposals (eg parking controls).

National PT patronage growth rates 2000/01–2007/08



2.3.4 Current regional PT targets

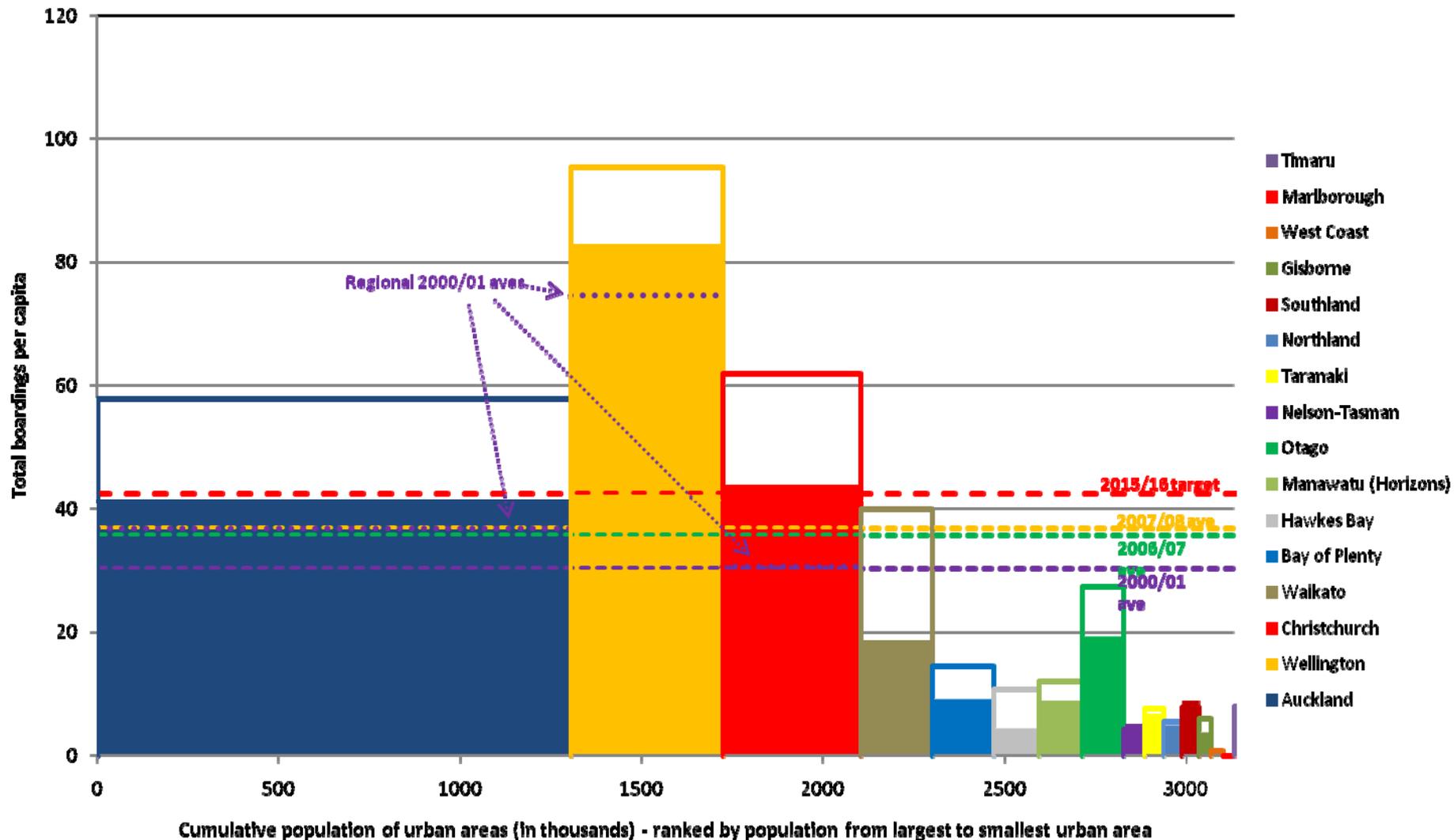
Region	Targets
Auckland	<ul style="list-style-type: none"> 85M PT boardings (60/capita) by 2015/16 (56% increase on 07/08)
Wellington	<ul style="list-style-type: none"> 50M PT boardings by 2016/17 - 'stretch' target (44% increase on 07/08)
Canterbury	<ul style="list-style-type: none"> 25M PT boardings (CHC) by 2015/16 (50% increase on 07/08)
Waikato	<ul style="list-style-type: none"> No formal target
Otago	<ul style="list-style-type: none"> For Dunedin, PT to carry 4.5% of all trips by 2014 (3.0% in 2001)
Bay of Plenty	<ul style="list-style-type: none"> % of JTW trips by PT ('stretch' targets): Tauranga 5.5% 2011, 10.5% 2021; Rotorua 5.0% 2011, 6.0% 2021
Wanganui- Manawatu	<ul style="list-style-type: none"> 1.7M PT boardings 2016 (60% increase on 07/08)
Gisborne	<ul style="list-style-type: none"> No specific targets ('increase over the next 5 years')
Hawke's Bay	<ul style="list-style-type: none"> PT carries 2% of all trips by 2016 (0.5% in 2006)
Southland	<ul style="list-style-type: none"> Patronage levels to exceed 500,000 pa
Taranaki	<ul style="list-style-type: none"> No specific targets
Northland	<ul style="list-style-type: none"> No specific targets
Nelson-Tasman	<ul style="list-style-type: none"> % JTW by PT to be at least 10% by 2018 ('stretch' target)
West Coast	<ul style="list-style-type: none"> No specific targets
Marlborough	<ul style="list-style-type: none"> N/a

Regional transport targets for sustainable transportation in New Zealand

TABLE B1: PT PATRONAGE TARGETS--SUMMARY BY REGION										
Centre	CURRENT/HISTORIC PATRONAGE				TARGET PATRONAGE					Key Policy Measures included
	07/08 Trips		00/01-07/0		15/16 Trips		07/08-15/16			
	Total Mpa	Cum % Nat Total	Per Cap	Trips/cap % pa	Total Mpa	07/08 Mpa	Per Cap	Tot Trips % pa	Trips/cap % pa	
Auckland	54.34	46.7%	41.7	1.9%	85.00	30.67	57.8	5.8%	4.2%	Major rail system investment, bus network restructure, increased bus service levels, upgraded bus VQS, bus priorities, IFT, comprehensive RTI. TDM measures.
Wellington	34.69	76.5%	82.8	1.5%	42.19	7.50	95.3	2.5%	1.8%	Major rail system upgrade (esp R/S), upgraded bus VQS, expanded P&R, extended bus priorities, IFT, i/change impts, comprehensive RTI. TDM measures.
Christchurch	16.65	90.8%	43.8	5.3%	25.00	8.35	61.9	5.2%	4.4%	Bus network restructuring, service level increases, bus priorities on main radials, new ticketing system, i/change impts, extended RTI. TDM measures.
Waikato	3.65	94.0%	18.6	11.1%	8.65	5.00	40.0	11.4%	10.0%	Bus network revisions and simplification, route extensions, service level improvements (incl regional services), extended operating hours, bus priorities, P&R development, RTI system extension.
Bay of Plenty	1.56	97.2%	9.1	46.6%	2.74	1.19	14.5	7.3%	6.0%	Bus service increases (areas served, routes, hours of operation, frequencies), bus priorities, upgraded VQS, new/upgraded transport centres, IFT, RTI.
Manawatu - Wanganui	1.06	98.1%	8.9	10.0%	1.50	0.44	12.0	4.4%	3.9%	Bus service increases (routes, hours of operation, frequencies), new service areas, bus priorities, upgraded VQS, new/upgraded bus stations, P&R, IFT.
Hawkes Bay	0.54	98.6%	4.4	2.4%	0.76	0.23	6.0	4.5%	4.1%	Enhanced bus service levels (incl operating hours and frequencies), bus stop upgrading incl seats and shelters), passenger information improvements.
Southland	0.42	98.9%	8.9	6.1%	0.48	0.05	10.2	1.5%	1.8%	Enhanced service levels, upgraded VQS (incl SLF buses), extended concession fares, improved timetable info.
Taranaki	0.35	99.2%	6.8	31.1%	0.41	0.06	7.8	2.1%	1.8%	NP bus service impts--network simplification, increased frequencies, upgraded infrastructure (bus stop facilities, terminals), improved information.
Nelson/ Tasman	0.30	99.5%	5.1		0.47	0.17	7.6	5.7%	5.0%	Expanded bus service provision (new areas, routes, frequencies, hours of operation), bus priorities, New/upgraded interchanges and infrastructure.
Otago- Wakatipu	N/A	N/A	N/A	N/A	3.22	N/A	150.0	N/A	N/A	Assumes minimal additional road capacity (SH6A etc), very high quality and level of PT services, strong parking restraint and other TDM measures.
Otago-- Dunedin	2.21	95.9%	19.3	0.0%	3.22	1.01	27.4	4.8%	4.5%	Bus network restructuring, service level increases, enhanced bus VQS, new ticketing system.
Northland	0.25	99.7%	4.8	42.8%	0.31	0.06	5.6	2.6%	1.8%	Impts to Whangarei bus services, incl frequencies, coverage, VQS, pass info, bus stop facilities.
Timaru	0.19	99.9%	6.9	-3.2%	0.22	0.03	7.9	1.9%	1.8%	
Gisborne	0.12	100.0%	3.7	5.4%	0.14	0.02	4.2	1.9%	1.8%	
West Coast	0.02	100.0%	0.6	-5.6%	0.02	0.00	0.7	1.7%	1.8%	
Marlborough									1.8%	
Total All GPS Nat Target	116.35	100.0%	36.8	2.8%	174.32	54.76	49.9	4.9%	3.9%	
	116.35				145.52	29.18	42.4	2.8%	1.8%	

Notes: VQS=vehicle quality standards; IFT=integrated fares & ticketing; RTI=real time information; P&R=Park and Ride; R/S=(rail) rollingstock; SLF=super low floor; TDM=transport demand management.

Total patronage by urban area, 2007/08 and 2015/16 targets (The areas in the graph indicates total patronage within each region)



2.3.5 PT regional targets – in perspective

- Aggregate of regional targets involves increase/capita (8 years) average 3.9%.
- This is higher than growth since 00/01 (2.8% pa/capita).
- Also more than twice the per capita rate (1.8% pa) to achieve GPS national targets.
- High regional estimate reflects high growth targets in Auckland and Christchurch in particular. These are taken directly from ‘official’ regional targets.
- For Auckland alone, forecast increase in patronage sufficient to meet national target. Auckland growth target much greater than past growth rates.
- One view that our regional estimates are too optimistic – GPS increase rate more realistic (unless strong ‘stick’ measures). If growth targets in Auckland and Christchurch were halved, national result would be close to GPS target.
- Another view that our estimates are too conservative – significantly higher growth rates should be achievable (subject to funding).

2.3.6 PT targets – some comments (1)

Pricing policies

- Generally assume no change in present modal pricing policies (fuel, road pricing, fares)
- Doubling of petrol prices likely to increase PT patronage 15% to 25% (subject to capacity) – would on its own go a long way to meeting growth target

Transfer journeys

- Auckland and Wellington targets assume boardings: journey ratios increase with integrated fares/ticketing – accounts for increase in Auckland boardings in order of 10%

Super Gold Card (SGC)

- SGC introduced October 2008 for people aged 65+ to travel off-peak for free
- No explicit allowance in forecasts for SGC impacts
- Prior estimates suggest an additional patronage increase (one-off) of 2% to 3%

2.3.7 PT targets – some comments (2)

- **Impacts on other targets**

Previous mode of new PT trips (IWA research)		Comments
Car driver	40%	Higher % peak, lower % off-peak
Car passenger	20%	Reduces average car occupancy, works against SOV target
Walk/cycle	20%	Reduces extent of W/C travel, but likely to support W/C target!
New trips	20%	
Total	100%	

- **Impacts of other (non-PT) policies**

- **Travel plans** – generally increase PT use, could be substantial if widely implemented
- **HOV measures** – likely to attract some PT passengers
- **Pricing TDM** (road pricing, fuel prices) – likely to result in substantial increases in PT use if major changes and widely implemented
- **Non-pricing TDM** – stronger parking control policies also likely to increase PT use

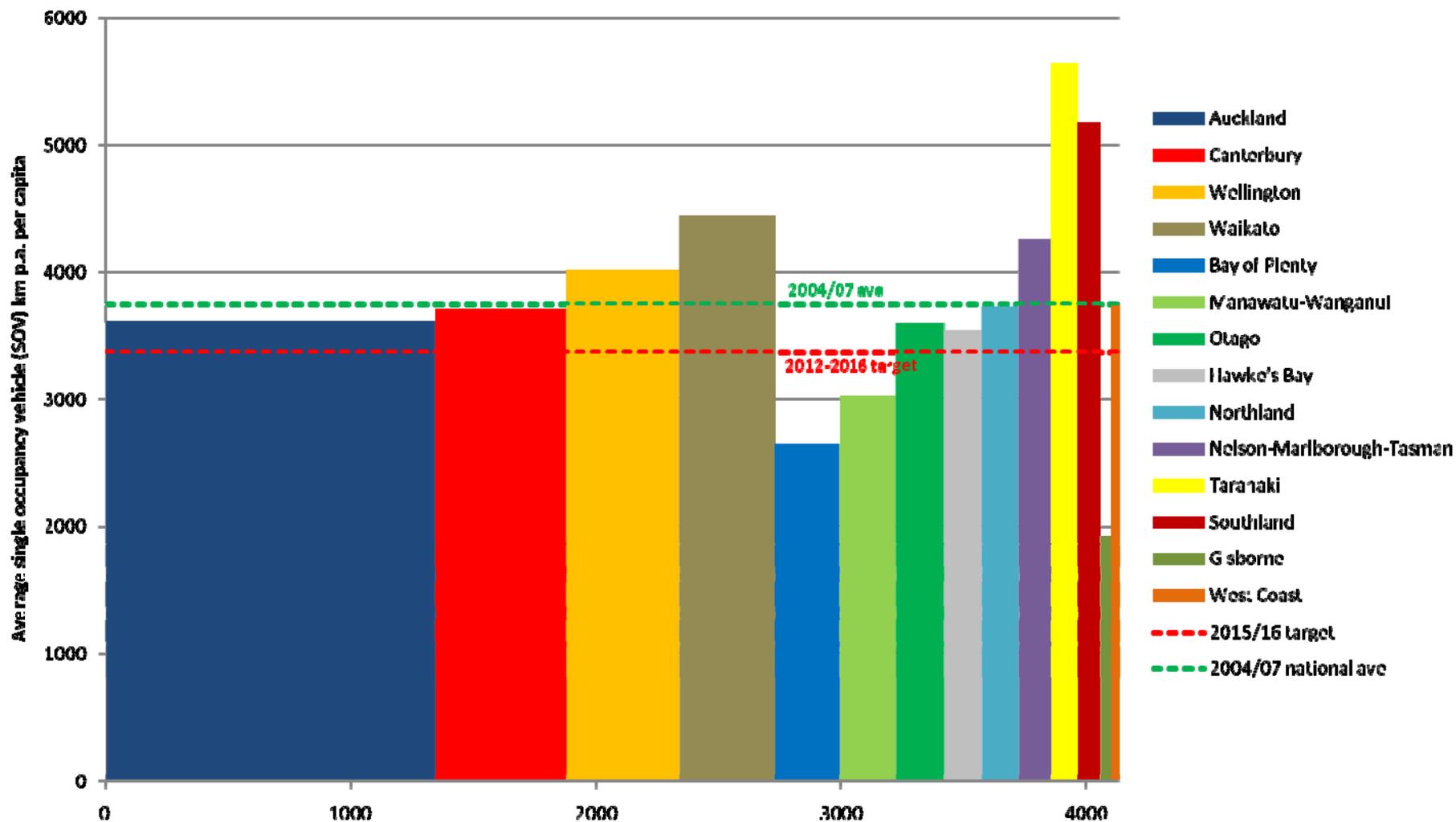
2.4 Single occupancy vehicle (SOV) travel

1. SOV KT current levels
2. SOV KT trends
3. The GPS (2008) national PT targets
4. Target-setting considerations
5. Proposed regional targets

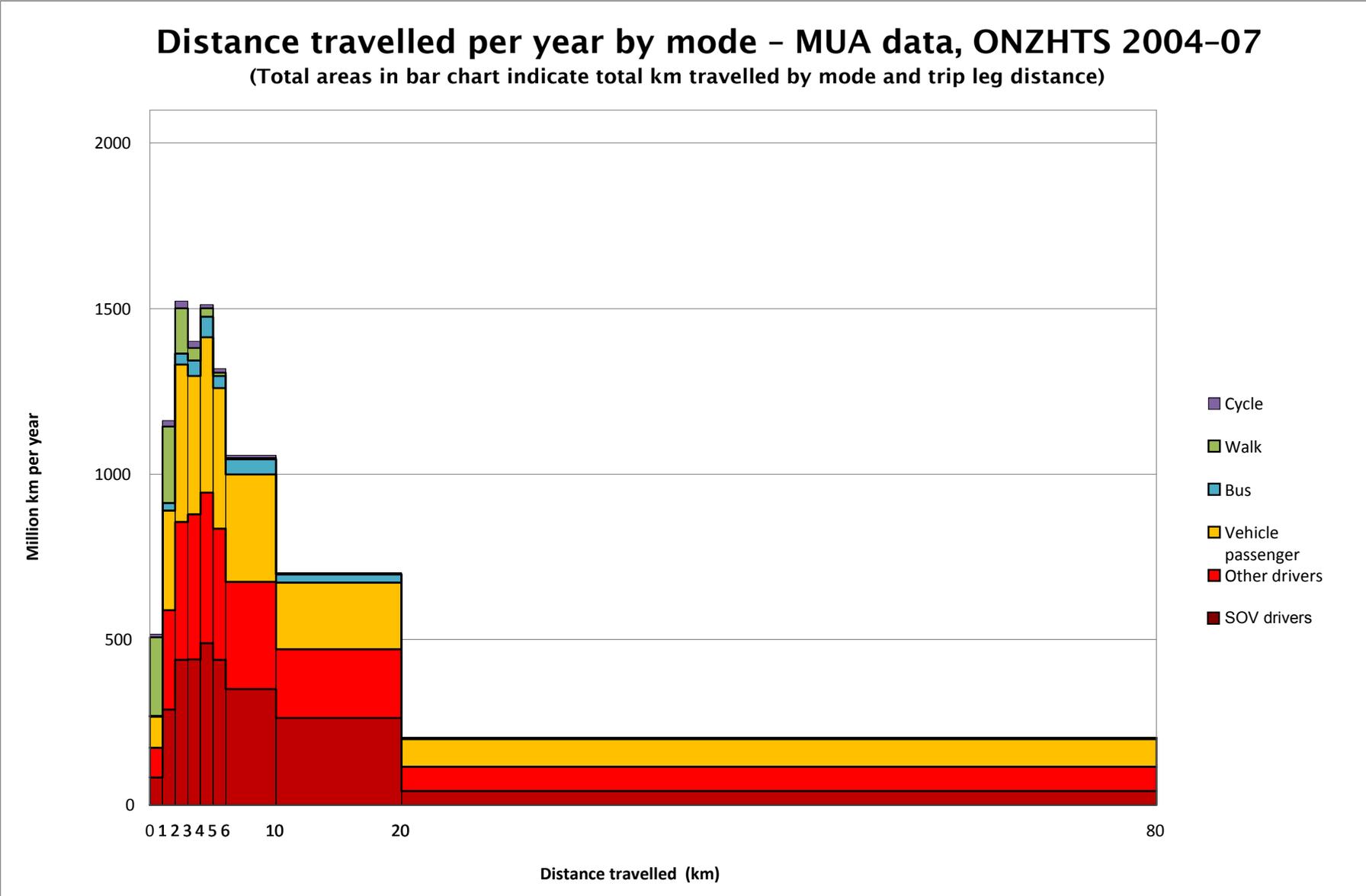
2.4.1 SOV KT current levels

- Reliable SOV KT data has not proved easy to come by
- This is not surprising as it is a new indicator and has not previously been monitored on a universal basis
- The ONZHTS provides an indication of current SOV KT per capita figures by region and SOV travel by distance category as illustrated in the following slides

SOV driver km per capita, by region, NZHTS 2004-07



Cumulative population of urban areas (in thousands) – ranked by population from latest to smallest urban area

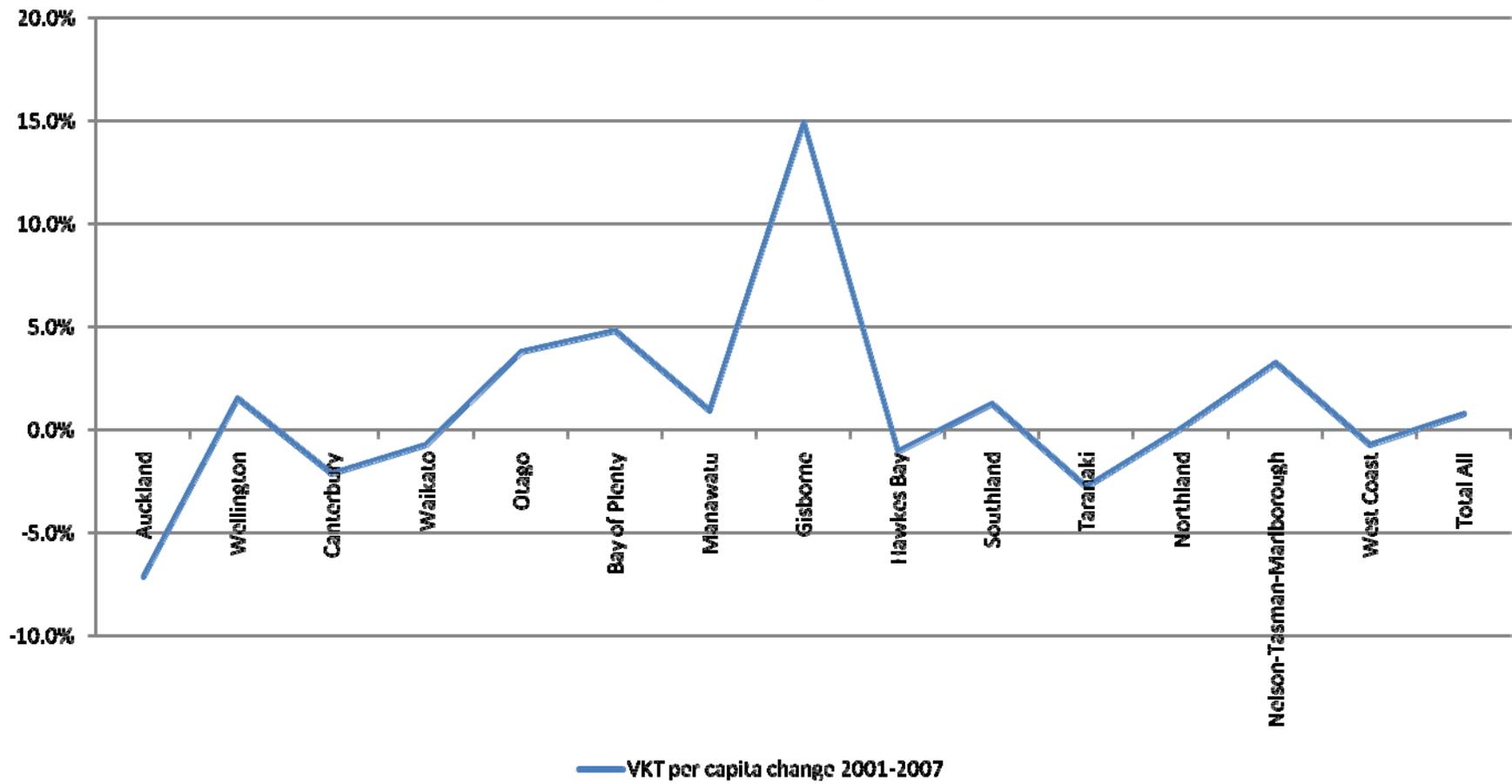


2.4.2 SOV KT trends

- All evidence, in NZ and elsewhere, is that it is extremely hard to increase average vehicle occupancy:
 - historically average occupancy has been stable or in gradual decline
 - as a result of smaller families, ageing population, and increasing car ownership
- SOV KT per capita is likely to follow broad VKT per capita trends and forecasts
 - our analysis of Census JTW data (essentially dividing vehicle drivers by vehicle passengers as a proxy measure) indicates that vehicle occupancy was relatively stable or declining slightly from 1996–2006

Trends

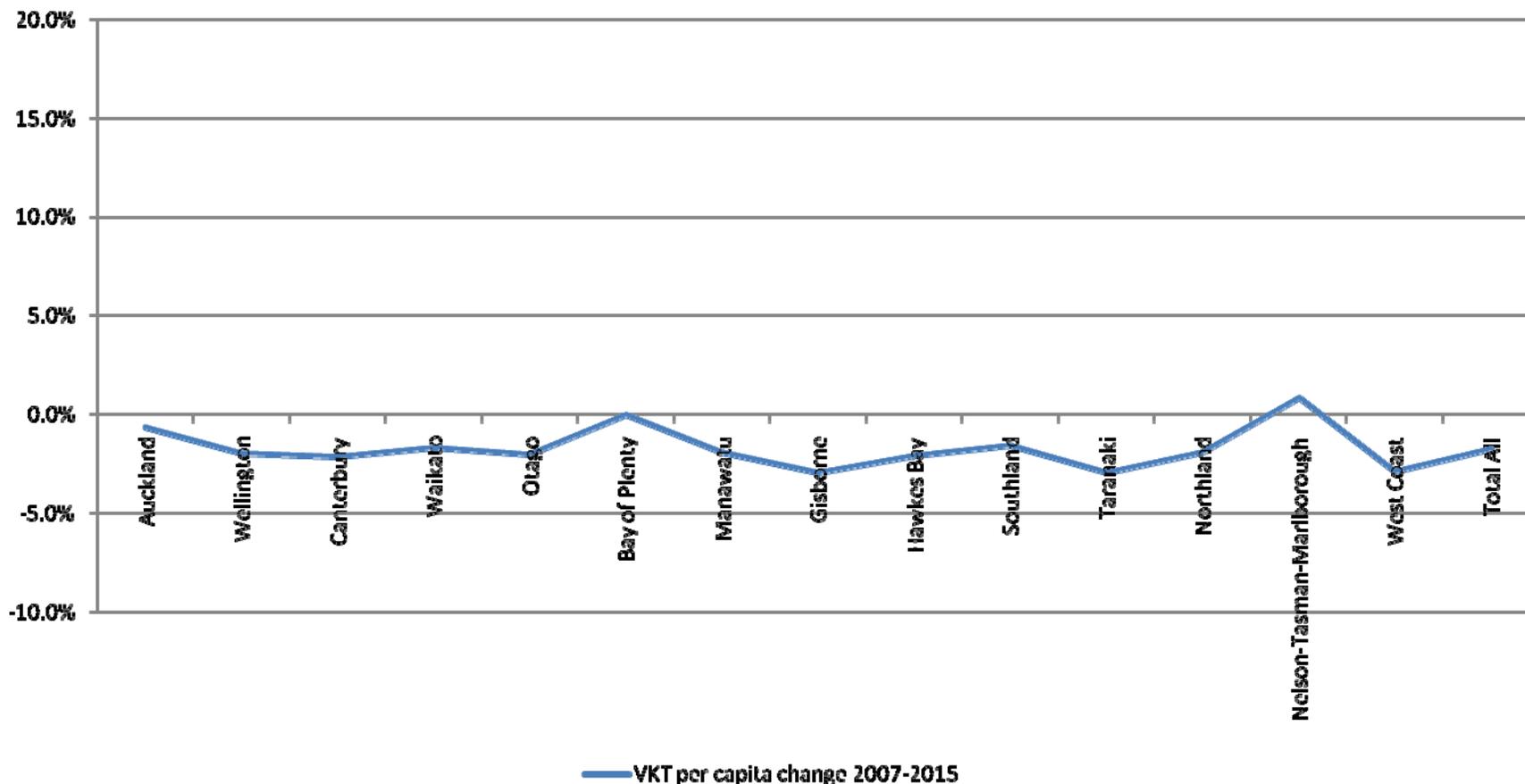
VKT per capita change 2001-2007



Source: Extrapolated from Vehicle Fleet Emissions Model, Ministry of Transport, 2008 and trends in NZHTS, 1997/98 and ONZHTS 03/04–06/07

Trends

VKT per capita change 2007-2015



Source: Extrapolated from Vehicle Fleet Emissions Model, Ministry of Transport, 2008 and trends in NZHTS, 1997/98 and ONZHTS 03/04-06/07

2.4.3 SOV KT interpretation

- VKT per capita has been increasing in recent years
- In the future VKT per capita is not expected to fall substantially
- Occupancies have been stable and are expected to remain so or to decline slightly into the future
- This means that SOV KT per capita over the period 2006/07–2015/16 is generally expected to continue to increase

2.4.4 GPS SOV KT (national) target

- **Reduce SOV KT/capita in major urban areas on weekdays by 10%**
- Applies to light four-wheel vehicles (excluding business travel) (refer section 2.1.1)

2.4.5 Achieving the SOV KT target (1)

- The SOV KT target is 10% below 2007 levels and a reduction in 2015/16 SOV KT per capita of well over 10% is likely to be needed
- Progress toward the SOV KT per capita target could be made through a variety of priced and non-priced means

2.4.6 Setting targets - what might be achievable?

- There are no quantified regional targets expressed in terms of SOV KT per capita; most refer to average vehicle occupancy (refer next page)
- In order to make progress towards the national target, more closely aligned regional targets are needed, for example, to:
 - reduce SOV KT
 - reduce the proportion of SOVs
 - increase vehicle occupancies

2.4.7 Existing regional (quantified) targets – summary

Region	Vehicle (Single Occupancy) Travel
Auckland	Through TDM etc measures, to halve the anticipated increase in vehicle traffic on the region’s road system, 2006-2016 - reduce the number of vehicle trips each morning peak by 20,000
Wellington	AM peak ave vehicle occupancy entering WGN CBD to be at least 1.50 by 2016 (2005 = 1.37) JTW private vehicle mode share in 2016 to no exceed 62% (2006 = 68%)
Canterbury	No specific targets (‘reduce SOV % in peak periods’) CHC UDS - reduce the proportion of single occupant motor vehicles in peak periods, by 2011
Waikato	Hamilton urban area; halve traffic growth to 1.5% pa (less than population growth)
Otago	By 2014, increase the peak period travel share of modes other than single occupancy private motor vehicles in Queenstown and Dunedin
Bay of Plenty	No specific targets
Manawatu- Wanganui	No specific targets (‘reduce SOV peak period mode share’)
Gisborne; Northland	No specific targets (‘reduce private vehicle usage’)
Hawkes Bay	No specific targets (‘increase average vehicle occupancy’)
Southland	No specific targets (‘reduce traffic demand’)
Taranaki; Tasman	No targets (‘promote travel demand measures’)
Nelson	Increase the number of vehicles with more than one occupant in the peak period across the Waimea Road / Rocks Road screenline to at least 10% by 2018

2.4.8 Achieving the SOV KT target (2)

- **Non-priced measures include:**
 - ✓ TDM strategies (alternative mode travel planning and supportive programmes)
 - ✓ HOV strategies (car pooling, HOV lanes, destination priority parking, transit shuttles and supportive programmes)
 - ✓ PT service level improvements (frequency, network coverage, reliability and speed)

2.4.9 Achieving the SOV KT target (3)

- **Potential priced strategies, include:**
 - ✓ Pricing - regional (parking charges, tolling, area wide charging)
 - ✓ Pricing - fuel tax (regional and/or national)
 - ✓ Fares policy (appropriately set, incentivised, discounted and free travel)
 - ✓ Variations in oil prices may also have a bearing on progress towards the targets

2.4.10 TDM-related strategies

- Focus on where regional councils can take action
- Choice of actions based on New Zealand experience and evidence (as far as possible!)
- Application varied from strategy to strategy and by region

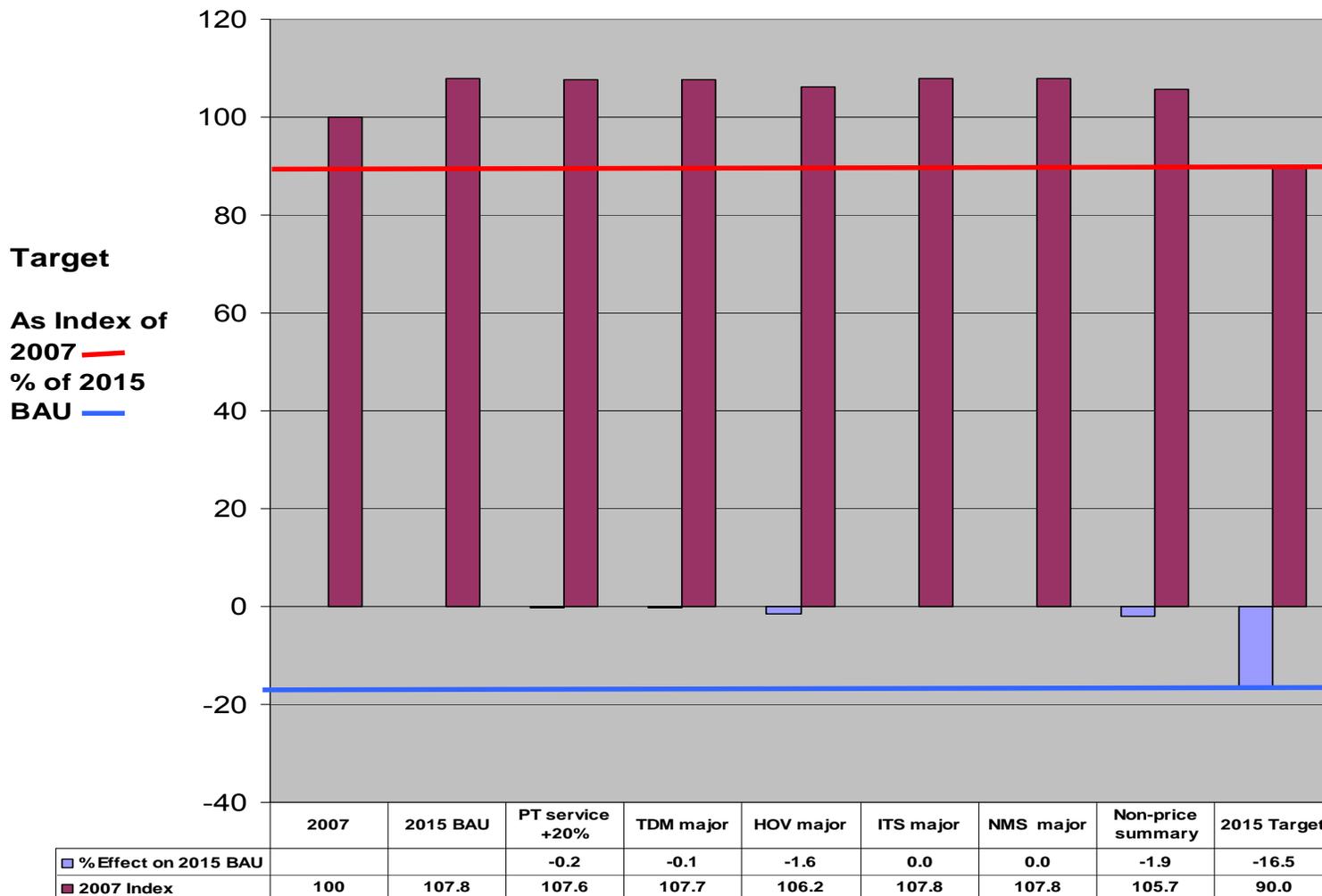
Primary strategies considered:

- Travel planning
- Parking management
- Teleporting
- Cycling network development
- HOV programmes
- Intensification
- Guaranteed ride home
- Mediated walking interventions

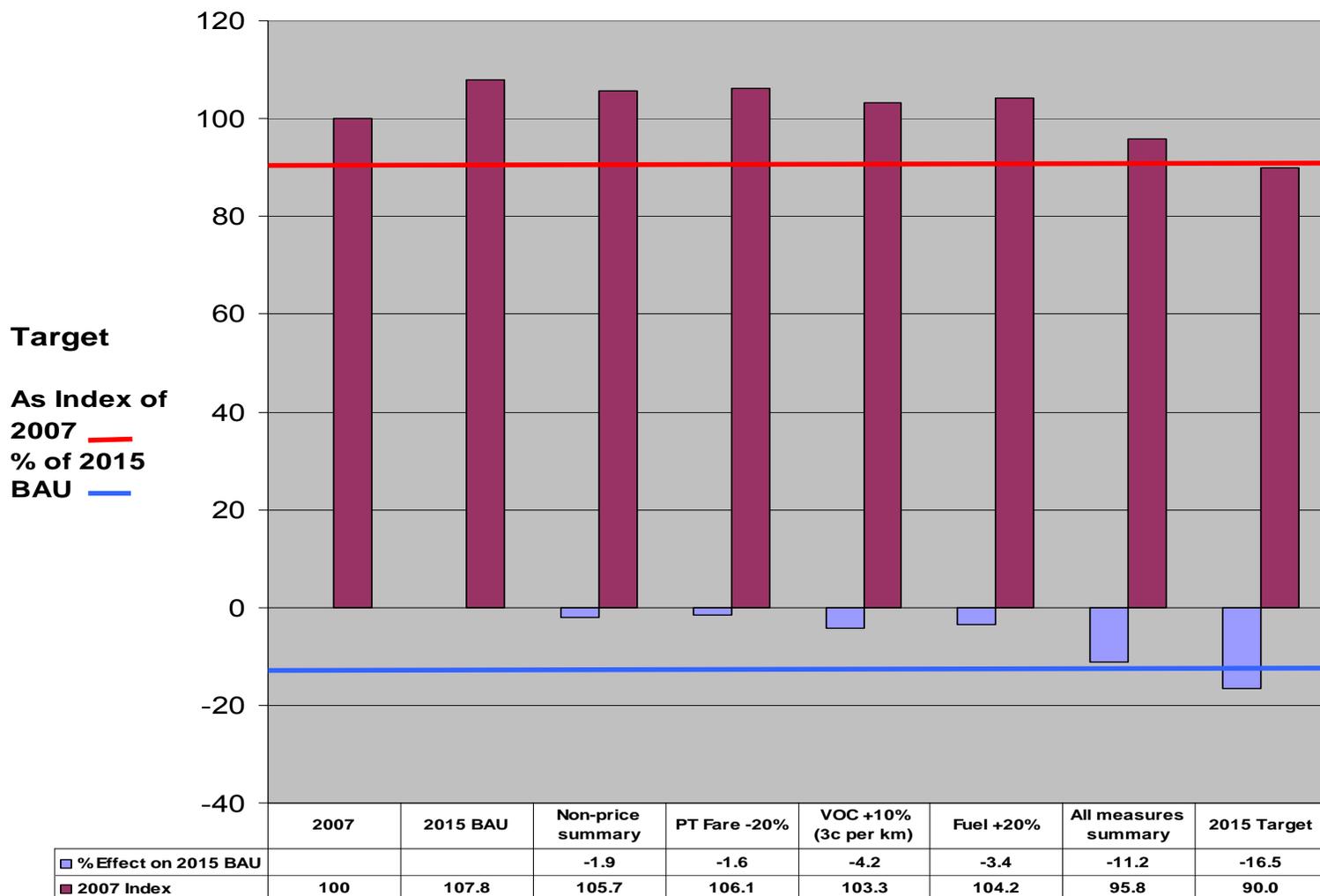
2.4.11 Estimated impact of various TDM measures

TABLE D4: SELECTED TDM MEASURES AND THEIR PROJECTED IMPACTS IN NEW ZEALAND		
Projected impacts on SOV KT and mode share in NZ		
Measure	Description	% of SOV KT reduction (relative to 2004/07 base)
Non-Pricing		
STP	All schools in NZ develop and implement STPs - 3.4% reduction in car psgr trips; 2.4% mode share to walk/cycle; 1.0% to PT - (a) remove 30% of driver trips from network and (b) remove 40% of driver trips from network	0.04% reduction in total VKT.
WPTP	50% of businesses with 20+ employees in Auckland, Waikato, Horizons Manawatu, Wellington, BOP, Canterbury, and Otago have high quality WPTP; Nelson - 50% of businesses with >50 employees have WPTP	3.30%
WPTP	30% of businesses with 20+ employees in Auckland, Waikato, Horizons Manawatu, Wellington, BOP, Canterbury, and Otago have high quality WPTP; Nelson - 30% of businesses with >50 employees have WPTP	2.00%
Teleworking	Approximately 20% of all employees telework 1 day per month	1% in 'Metro' (A, W, C); 0.5% in other MUAs
Teleworking	All employees telework 1 day per month or 25% of employees telework 1 day per week	5% in 'Metro' NZ; 2.5% in other MUAs
Guaranteed Ride Home	"Emergency ride home," provides non-SOV commuters with a guaranteed 'ride' in the event of a personal or family emergency, illness, or unexpected employment-related delay.	1.40%
Personalised Travel Planning	25% of NZ population participates in a 'standard' programme (as per NZTA's <i>Economic Evaluation Manual</i> , volume 2 [EEM2]) in Auckland, Waikato, Canterbury, Wellington, BOP and Otago; 25% of NZ population participates in a 'low' programme (EEM2) elsewhere	3.10% (of all driver trips) standard; 1.0% low - mean: 2.0%
Intensification	Doubling population density is associated with a 60 percent decline in VMT per capita. Negative direct effect is offset by positive indirect effects (22 percent), yielding a net, or total, elasticity of -0.381 . Hence, effect of 1% increase in density in selected MUAs (in Auckland, Wellington and Canterbury regions), results in 0.5% decline in SOV KT. Other MUA densities are considered too small for there to be a measurable effect.	0.50%
Pedestrian and cycling network improvements	By 2015, further integration (e.g. traffic calming & traffic management in conjunction with infrastructure) and lengthening of cycling network in all MUA-regions - assumes 1% increase in mode share (e.g. from 2-3%) for cycling, one-half coming from drivers & one-half from vehicle passengers; potential increases in pedestrian trips as a result of increased safety. Decrease in driver's KT pro-rated to account for SOV target. Smaller regions: assume 2% increase in W/C	0.50%
Mediated walking interventions	Could be re-branded physical activity programme (such as the Government's 'push-play' programme) or refocus of personalised travel planning, prescribing walking & supported through internet/telephone contact - RCT indicate there is an effect, not able to be quantified at present.	
HOV	Definite increases in vehicle occupancy recorded, though often at the expense of PT	1.60%
Parking levy	Based on Auckland Road Pricing Evaluation Study (ARPES) \$5 parking charge - widely applied in congested areas & major destinations - covering all car parks within reasonable walking distance	2.00%
Nottingham charge	Levied on employers at an increasing annual fee per car park provided for employees - where at least 10 parks provided - could be tackled through FBT	1.80%
Cordon toll	Using results from ARPES - could reduce vehicle traffic by 5-6% ($\approx 4\%$ SOV); increase PT from 7 to 12 or 9 %; increase w/c from 15 to 17; assuming ALL MUAs implement cordon, 6 am to 10 am affecting journey to work (JTW) and return trip - approx 42% of all car driver trips)	1.3%
Cordon toll	As above, but cordon implemented in Auckland, Wellington, Christchurch, BOP, Hamilton	1.10%
Public Transport	PT service enhancements - assumes that PT service enhancements cause a relative increase of 3% per annum (cumulating each annum). Walking trips increase 1.35% per 1% point absolute increase in PT mode share; driver trips decrease by 0.4%.	0.8%

SOV KT per Capita - Non Priced Effect



SOV KT per Capita - Priced Effect

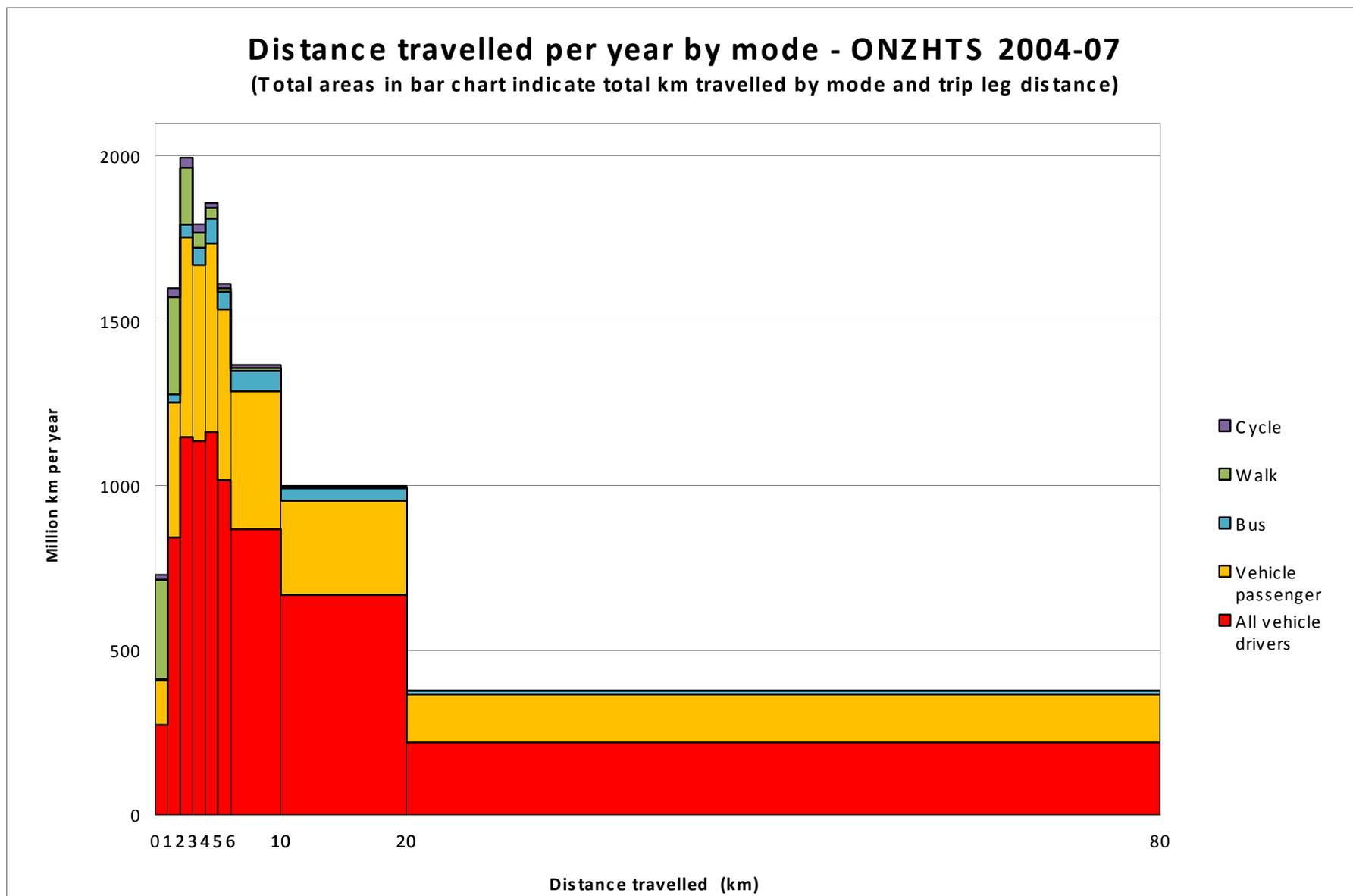


2 Regionalising the 2008 GPS targets

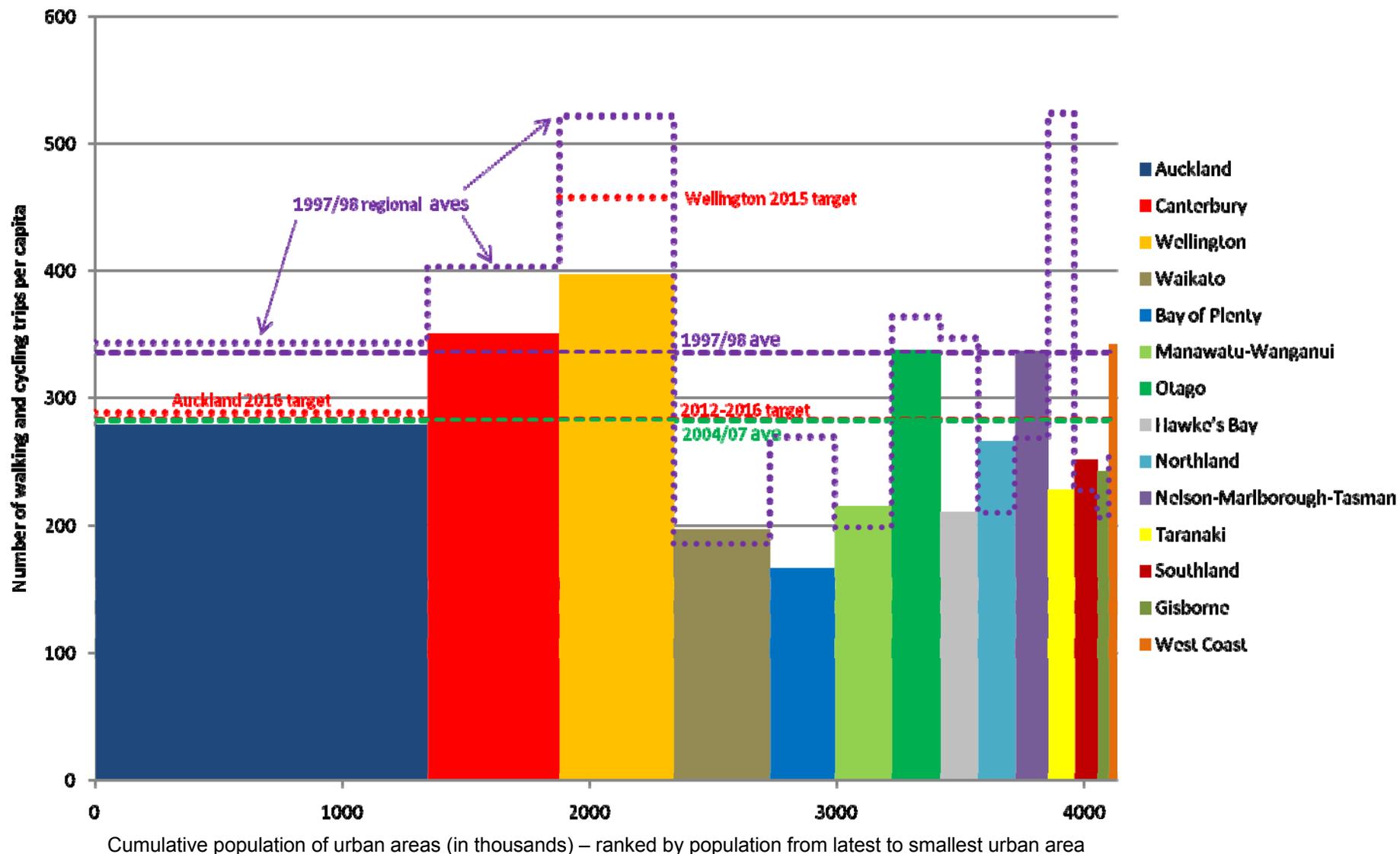
TABLE: SOV VKT TARGETS--SUMMARY BY REGION										
Region	MUAs	2004/07			2015/16				2015/16	
		Baseline			TARGET SOV KT	SCENARIO 1 - Assume underlying trend: zero-change in SOV KT / capita / year (pre-interventions)			SCENARIO 2 - Assume underlying trend: 5% decline in SO VKT per person in total by 2015/16; measures have same impact as Scenario 1	
<i>Total</i>										
		Million km travelled by residents	% of national total	Km per resident per year	10% reduction in annual km per resident by 2015	Impact of non-priced TDM measures	Impact of priced TDM measures	Projected Km per resident	SOV KT in 2015/16 (pre-intervention)	SOV KT in 2015/16 (post-intervention)
Northland	Whangarei	111.59	1%	2457	2211.02	2.0%	n/a	2407.56	2333.86	2287.18
Auckland	North Shore Waitakere Auckland Manukau	4147.97	47%	3310	2978.59	7.0%	2.0%	3011.68	3144.06	2861.10
Waikato	Hamilton	616.01	7%	3563	3206.78	5.0%	2.0%	3313.67	3384.94	3147.99
Bay of Plenty	Tauranga Rotorua	334.77	4%	2457	2211.02	5.0%	2.0%	2284.73	2333.86	2170.49
Gisborne	Gisborne	72.95	1%	2363	2126.47	2.0%	n/a	2315.49	2244.61	2199.72
Hawkes Bay	Napier-Hastings	277.20	3%	2363	2126.47	2.0%	n/a	2315.49	2244.61	2199.72
Taranaki	New Plymouth	269.91	3%	2363	2126.47	2.0%	n/a	2315.49	2244.61	2199.72
Manawatu - Wanganui	Wanganui Palmerston North	109.42	1%	2363	2126.47	4.0%	n/a	2268.23	2244.61	2154.82
Wellington	Kapiti Wellington	1407.98	16%	3459	3113.28	6.0%	2.0%	3182.46	3286.24	3023.34
Tasman	NO MUA									
Nelson	Nelson	165.63	2%	2820	2537.58	4.0%	n/a	2706.75	2678.56	2571.42
Marlborough	NO MUA									
Canterbury	Christchurch	838.09	10%	2386	2147.71	5.0%	2.0%	2219.30	2267.03	2153.67
West Coast	NO MUA									
Otago	Dunedin	317.09	4%	2737.65	2463.89	4.0%	n/a	2628.15	2600.77	2496.74
Southland	Invercargill	135.51	2%	2819.54	2537.58	2.0%	n/a	2763.15	2678.56	2624.99
total		8804.12	100%	3038.5	2734.66					

2.5 Walk and cycle travel – trends, targets and strategies

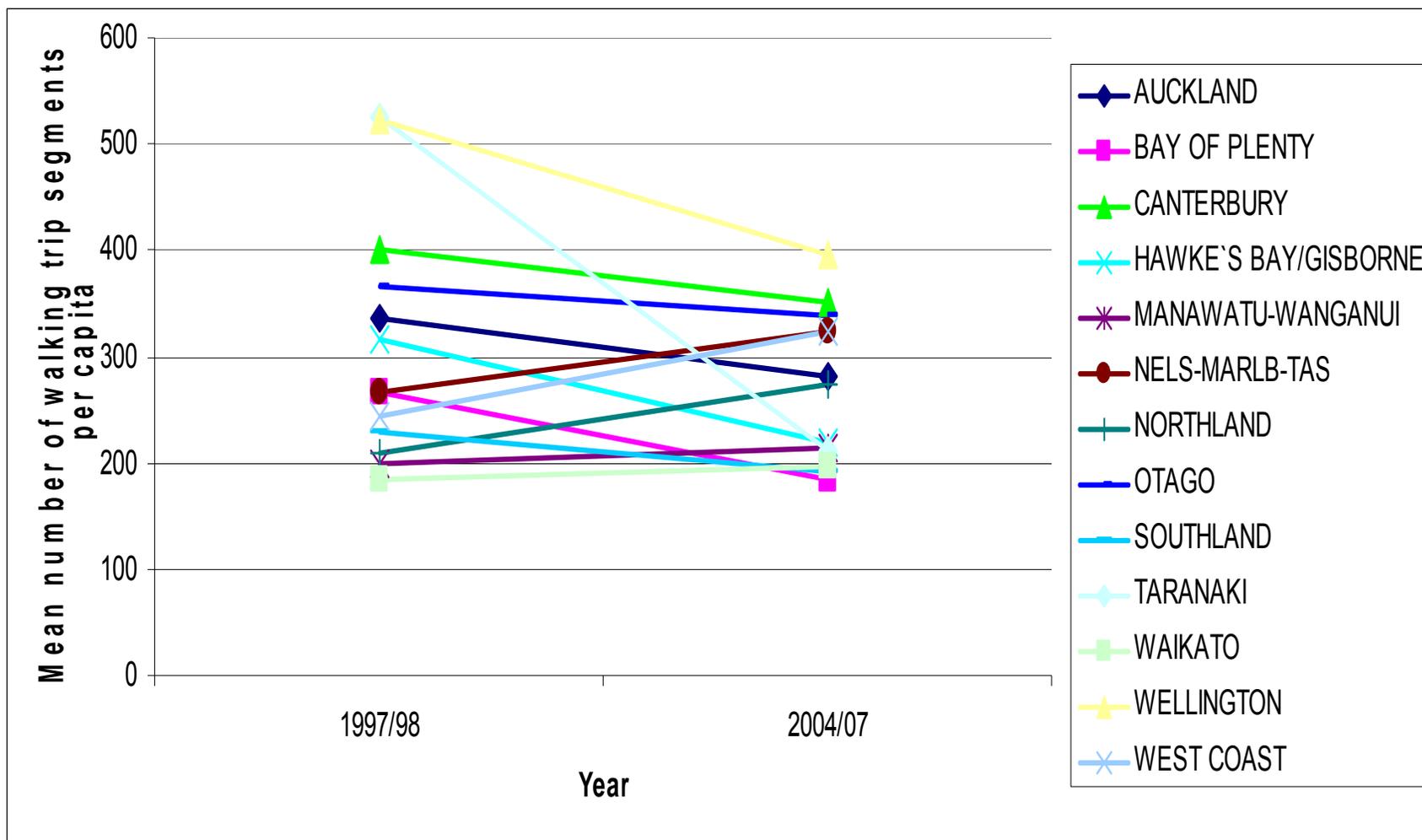
1. Walking and cycling current levels and trends
2. Impacts of W/C policy measures – past experience
3. Basis for setting regional targets
4. Regional W/C target results
5. Comments



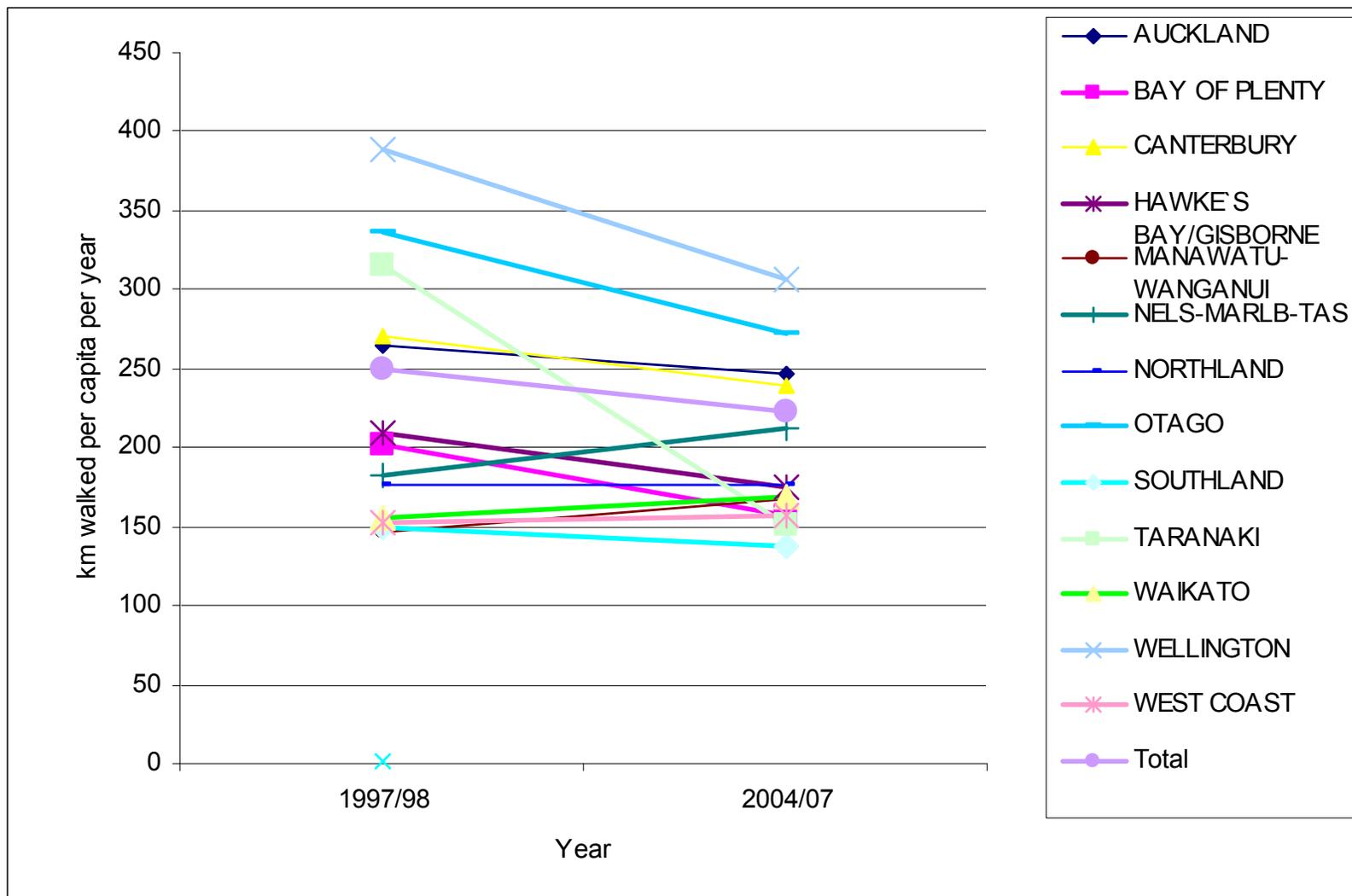
Walking/cycling trip segments per capita, by region, NZHTS 2004-07 (Compared with 1997/98 levels)



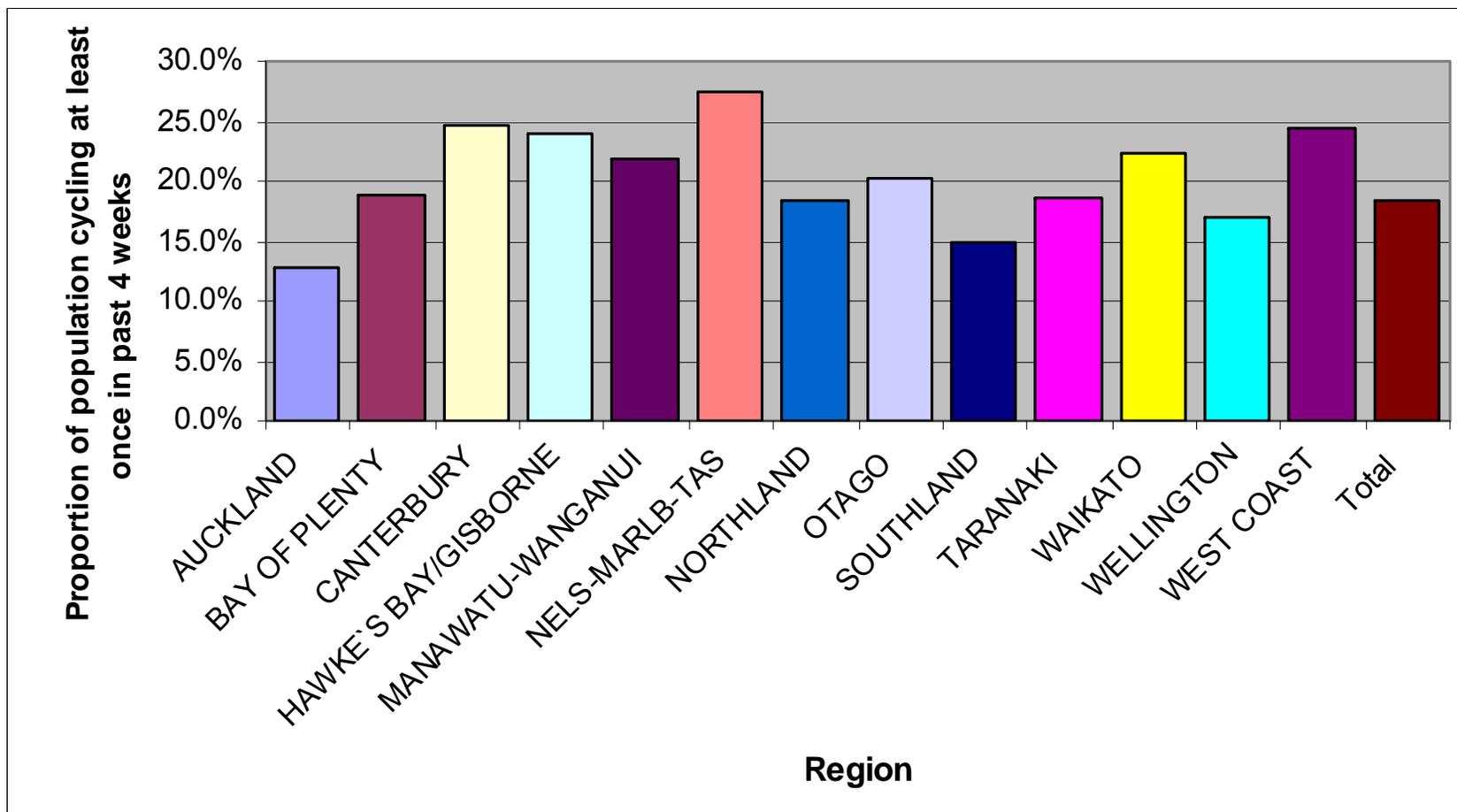
Walking/cycling trip legs per capita by region (NZHTS 1997/98 and ONZHTS 2004-07 data)



Trends in km/capita by region - walking (NZHTS 1997/98 and ONZHTS 2004-07 data)

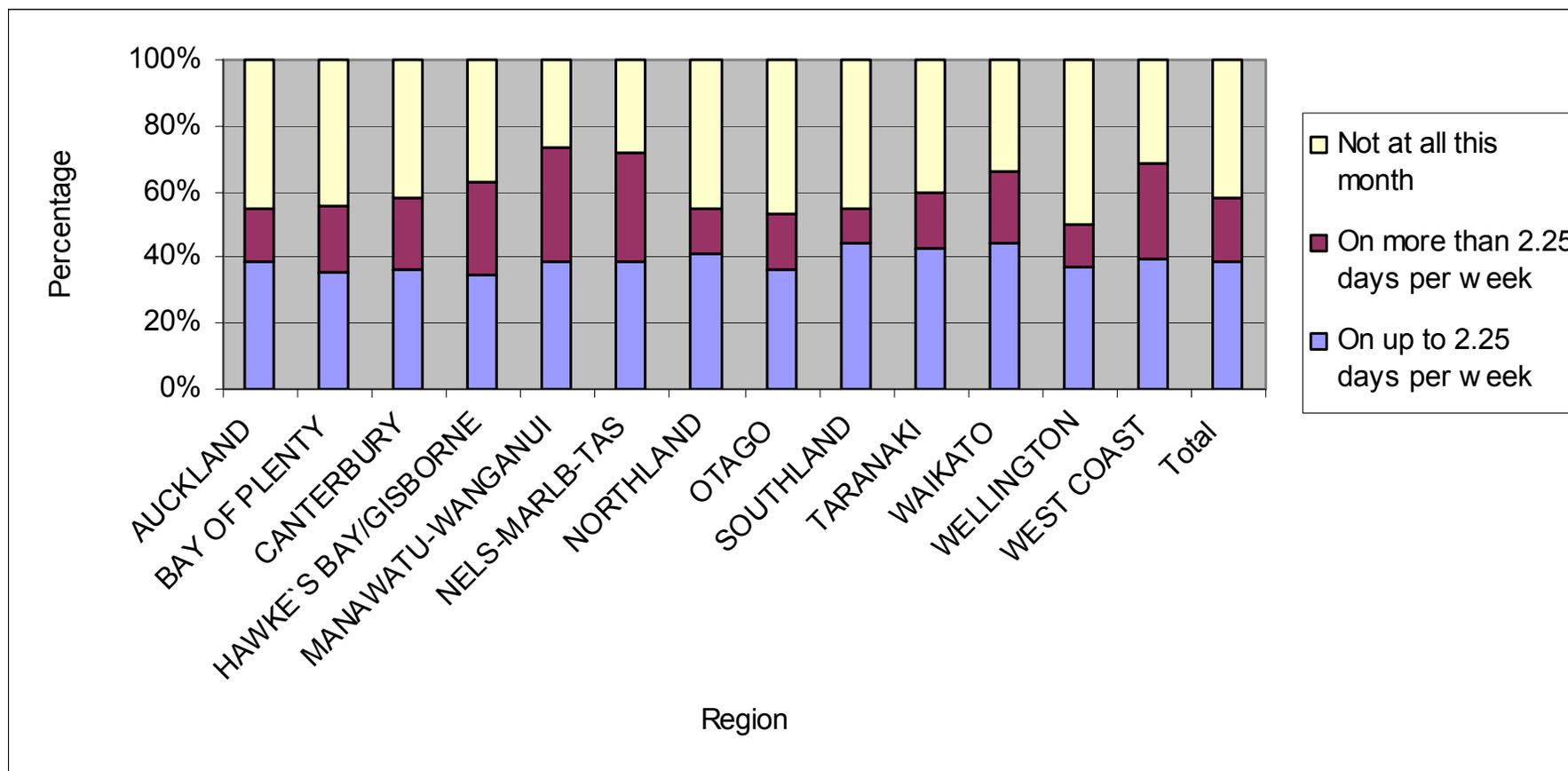


Proportion of people cycling at least once in last four weeks* by region (ONZHTS 2004-07)



*Appendix F suggests using this data from the ONZHTS as a means of monitoring cycling activity by region. This information is also available for people cycling at least once in the last 12 months.

Cyclists' frequency cycling in last four weeks by region (ONZHTS 2004-07)*



This information, along with previous slide (proportion of people cycling at least once in last four weeks), provide valuable monitoring of 'more people walking and cycling more often' (as per *Getting There* (MoT 2005), the NZ Government's walking and cycling strategy.

2.5.1 GPS (2008) walking/cycling national target

*** **Increase number of walking and cycling trips by 1% per year through to 2015/16**

- Data from ONZHTS 03/04–06/07 database (total walking and cycling trip legs) – 1115.5M
- Requires increase **9.4%** total over nine years from 2006/07 to 1230M in 2015/16
- On a per capita basis, ‘active’ mode travel nationally declined some 16% from 1997/98 to 2004–07. The decline in cycling travel was around 30%, in walking travel about 15%
- The GPS (2008) national target for 2015/16 is essentially to maintain current **per capita** levels of W/C. This may be challenging, given the past trends.

2.5.2 Existing regional (quantified) targets – summary

Auckland	15.5% of all trips to use active modes by 2016 (2006 = 15.1%)
Wellington	15% of all JTW trips by active modes by 2016 – ‘stretch’ target 2005/06 = 13%)
Canterbury	Christchurch: 12% of all trips <i>by cycle</i> by 2011 (1996 = 6%)
Waikato	No formal target
Otago	% of all trips by active modes: 15% by 2014 (2001 = 12%); 6% c 2014 (2001 = 3%)
Bay of Plenty	% of JTW trips by active modes (‘stretch’ targets): Tauranga: 4.0% C, 5.0% W by 2011; 5.0% C, 5.5% W by 2021 Rotorua: 4.0% C, 6.2% C by 2011; 5.5% C, 6.5% W by 2021
Manawatu	20% of all JTW trips by active modes by 2016 (2001 = 15%)
Gisborne	10% increase in active mode use for work and school travel
Hawke’s Bay, Southland, Taranaki, Northland	No specific targets (‘increase’)
Nelson	% JTW by active modes to increase at least 25%
West Coast	% JTW by active modes by 2014: W 12%, C 5%
Marlborough, Tasman	N/A

2.5.3 Estimated impact of various TDM measures

TABLE D4: DESCRIPTION OF MODELLED SCENARIOS FOR SELECTED TDM MEASURES AND THEIR PROJECTED IMPACTS	
Measure	Description
Non-Pricing	
STP	All schools in NZ develop and implement STPs - 3.4% reduction in car psgr trips; 2.4% mode share to walk/cycle; 1.0% to PT - (a) remove 30% of driver trips from network and (b) remove 40% of driver trips from network
WPTP	50% of businesses with 20+ employees in Auckland, Waikato, Horizons Manawatu, Wellington, BOP, Canterbury, and Otago have high quality WPTP; Nelson - 50% of businesses with >50 employees have WPTP
WPTP	30% of businesses with 20+ employees in Auckland, Waikato, Horizons Manawatu, Wellington, BOP, Canterbury, and Otago have high quality WPTP; Nelson - 30% of businesses with >50 employees have WPTP
Teleworking	Approximately 20% of all employees telework 1 day per month
Teleworking	All employees telework 1 day per month or 25% of employees telework 1 day per week
Guaranteed Ride Home	"Emergency ride home," provides non-SOV commuters with a guaranteed 'ride' in the event of a personal or family emergency, illness, or unexpected employment-related delay.
Personalised Travel Planning	25% of NZ population participates in a 'standard' programme (as per NZTA's <i>Economic Evaluation Manual</i> , volume 2 [EEM2]) in Auckland, Waikato, Canterbury, Wellington, BOP and Otago; 25% of NZ population participates in a 'low' programme (EEM2) elsewhere
Intensification	Doubling population density is associated with a 60 percent decline in VMT per capita. Negative direct effect is offset by positive indirect effects (22 percent), yielding a net, or total, elasticity of - 0.381. Hence, effect of 1% increase in density in selected MUAs (in Auckland, Wellington and Canterbury regions), results in 0.5% decline in SOV KT. Other MUA densities are considered too small for there to be a measurable effect.
Pedestrian and cycling network improvements	By 2015, further integration (e.g. traffic calming & traffic management in conjunction with infrastructure) and lengthening of cycling network in all MUA-regions - assumes 1% increase in mode share (e.g. from 2-3%) for cycling, one-half coming from driver & one-half from vehicle passengers; potential increases in pedestrian trips as a result of increased safety. Decrease in driver's KT pro-rated to account for SOV target. Smaller regions: assume 2% increase in W/C
Mediated walking interventions	Could be re-branded physical activity programme (such as the Government's 'push-play' programme) or refocus of personalised travel planning, prescribing walking & supported through internet/telephone contact - RCT indicate there is an effect, not able to be quantified at present.
HOV	definite increases in vehicle occupancy recorded, though often at the expense of PT
Parking levy	Based on Auckland Road Pricing Evaluation Study (ARPES) \$5 parking charge - widely applied in congested areas & major destinations - covering all car parks within reasonable walking distance
Nottingham charge	Levied on employers at an increasing annual fee per car park provided for employees - where at least 10 parks provided - could be tackled through FBT
Cordon toll	Using results from ARPES - could reduce vehicle traffic by 5-6% (≈4% SOV); increase PT from 7 to 12 or 9 %; increase w/c from 15 to 17; assuming ALL MUAs implement cordon, 6 am to 10 am affecting journey to work (JTW) and return trip - approx 42% of all c
Cordon toll	As above, but cordon implemented in Auckland, Wellington, Christchurch, BOP, Hamilton
Public Transport	PT service enhancements - assumes that PT service enhancements cause a relative increase of 3% per annum (cumulating each annum). Walking trips increase 1.35% per 1% point absolute increase in PT mode share; driver trips decrease by 0.4%.

Regional transport targets for sustainable transportation in New Zealand

Region	2004/07				2015/16							2015/16	
	Baseline				TARGET W/C		SCENARIO 1 - Assume underlying trend: zero- change in walk trips / capita / year (pre- interventions)				SCENARIO 2 - Assume underlying trend: 5% decline in walk trips per person in total by 2015/16; measures have same impact as Scenario 1		
	Population	Million trips travelled by residents	% of national total	Trips per resident per year	9.3% increase in w/c trips by 2015/16 (1% per year)	Projected population growth rate to 2015/16	Projected M trips by 2015/16 - pre- intervention (incl pop growth)	Impact of non-priced TDM measures*	Projected trips per resident	Projected M trips by 2015/16 - post- intervention (incl pop growth)	Projected M trips by 2015/16 - pre- intervention (incl pop growth)	Projected M trips by 2015/16 - post- intervention (incl pop growth)	
Northland	146035	40.0	3.4%	273.9	43.72	1.045	41.80	2%	279.4	42.64	39.71	40.50	
Auckland	1338036	375.0	32.2%	280.3	409.88	1.126	422.25	5%	294.3	443.36	401.14	421.19	
Waikato	387131	76.0	6.5%	196.3	83.07	1.054	80.10	2%	200.2	81.71	76.10	77.62	
Bay of Plenty	238313	44.00	3.8%	184.6	48.09	1.072	47.17	2%	188.3	48.11	44.81	45.71	
Gisborne/ Hawkes Bay	195521	43.00	3.7%	219.9	47.00	1.018	43.77	2%	224.3	44.65	41.59	42.42	
Taranaki	113257	24.0	2.1%	211.9	26.23	0.991	23.78	2%	216.1	24.26	22.59	23.05	
Manawatu- Wanganui	225488	48.0	4.1%	212.9	52.46	1.009	48.43	2%	217.1	49.40	46.01	46.93	
Wellington	461466	183.0	15.7%	396.6	200.02	1.045	191.24	4%	412.4	198.88	181.67	188.94	
Nelson - Tasman - Marlborough	138691	45.0	3.9%	324.5	49.19	1.045	47.03	2%	331.0	47.97	44.67	45.57	
Canterbury	528204	186.0	16.0%	352.1	203.30	1.063	197.72	2%	359.2	201.67	187.83	191.59	
West Coast	33989	11.0	0.9%	323.6	12.02	0.973	10.70	4%	336.6	11.13	10.17	10.57	
Otago	197214	67.0	5.8%	339.7	73.23	1.036	69.41	2%	346.5	70.80	65.94	67.26	
Southland	108974	21.0	1.8%	192.7	22.95	0.964	20.24	2%	196.6	20.65	19.23	19.62	
total	4112319	1163.0	100%		1271.16	1.072	1243.65			1285.23	1181.47	1220.97	

2.6 Monitoring and measurement issues

- Existing datasets used for this research:
 - PT boarding data collected by NZTA as part of annual reporting
 - SOV KT and walking/cycling data drawn from ONZHTS - can be reported on an annual basis (as a four-year rolling average)
- Existing sources have weaknesses:
 - PT boarding data inconsistently reported and routinely does not include commercial services
 - ONZHTS has insufficient sample sizes to monitor regions individually
 - Walking and (especially) cycling are relatively uncommon, such that margins of error are very wide, making it difficult to confidently establish trends
- Other sources explored (eg Census journey to work data), conclusion is that existing sources, with some improvements will prove to be the most reliable

See appendix F for further details.

Appendix A: Current regional strategies, policies and targets

Information in this appendix is based on data and reports available in mid to late 2008. Information about greenhouse gas emissions, transport reliability and road safety targets by regions is included for alignment with the 2008 *Government policy statement on land transport funding*.

Appendix A

TABLE A1: NZ REGIONAL TRANSPORT TARGETS--PUBLIC TRANSPORT			
Region	Source	Target	Comments
Auckland	RLTS	* 2016: PT 11% of all peak trips in region, 49% of motorised trips in to CBD in the morning peak by PT, 38% of motorised trips southwards across the Harbour Bridge in the morning peak by PT and 18% of motorised trips into the Isthmus in the morning peak by PT.	Expected result - model forecast based on implementation of RLTS strategy. There are a range of other 'expected results' targets identified in the RLTS relating to PT including: choice of travel mode and ease of interchange between modes; PT access for people with disabilities; number of households within 30 minutes travel time of employment by pt - additional 37,000 households by 2015; rapid transit service frequency in am peak period - at least every 10 minutes.
	PTNP/ARTA Monitoring Report	* 2015/16: 98M PT trips (68 trips/capita, 11% AM peak mode share), subject to additional funding; 77M trips (54 trips/capita, 85% AM peak mode share), on basis of funding levels anticipated in 2006/07. *2005/06 statistics were approx 50M trips, 38 trips/capita, 7% AM peak mode share.	Resulting from the ATSAP work, the target agreed with MoT as most realistic was revised to 85M pax in 2015/16 (details/confirmation awaited). Refer also ATSAP papers for detailed analysis/ discussion.
Wellington	RLTS	**Key outcome' (stretch) target 2016/17: 25M PT trips peak (18.3M in 2005/06, 17.5M in 2006/07); * Target 2016/17: 25M PT Trips off-peak (16.7M 05/06, 16.6M 06/07) **Key outcome' (stretch) target 2016/17: PT 21% of all JTW trips (17% in 2006)	
Canterbury	Metro Strategy (2006-2012)	* 2015/16 Target 25M PT trips per year. Target set in Metro Strategy 2006-2012. This will require an annual average patronage growth of 5% between 2005/6 and 2015/16; around one million more passenger trips per year every year. *2011 CHC UDS target 6% of all (excl walk) trips by PT by 2011 (1996=3%)	AMR 06/07 reports that Public transport passenger trips rose 0.5% to 15.898 million in 2007. This has not met the target of a 5% growth, but there has been a gradual increase in public passenger transport trips from 1995 to 2007. 1996 statistics show a 3% mode share, 2001 statistics show a 3% mode share, 2006 show a 4% mode share (data from Census Journey to Work as reported in the AMR). Indicators suggest a positive trend towards the target. May be achieved with sustained high petrol prices. Regular measurement of share is biggest headache - currently under discussion with MoT.
	ECan LTCCP 2006-16 CTP Steering Group	*PT 17.47M trips 2007/08 *PT 1.0M extra trips each year, next 10 years.	These figures are intended to broadly correlate with the Metro Strategy - which are the 'official' targets, alongside the RLTS.
Waikato	RLTS 2006	*No formal PT target been set	
	LTCCP 2006 Hamilton Alternative to Roding Transportion Study 2006 (HARTS)	*Achieve a 85% user satisfactory rating from the annual PT user satisfaction survey. *11% mode shift from private vehicles in 2025	Hamilton urban target only
Manawatu- Wanganui	RLTS	*2016 PN target 3% of JTW trips (1.7% in 2006)	Considered realistic - this would take the city's PT use for JTW back to 1986 mode share level. 2006 census showed 1.66% mode share - up from 1.07% in 2001
	RLTS	*2016 nationwide target of 1,700,000 PT trips (1,036,000 nationwide PT trips in 2004-05)	1,034,000 trips in 2006-07, 1,063,000 in 2007-08
Bay of Plenty	RLTS	Stretch targets for PT JTW mode shares: Tauranga 2011 5.5%, 2021 10.5% (2001 0.5%); Rotorua 2011 5.0%, 2011 6.0% (2001 0.9%)	Targets set in 2007 RLTS. Targets now likely to be unachievable. Tauranga targets also included in Western Bay of Plenty SmartGrowth Strategy.
Otago	RLTS Dunedin PT strategy (informal targets only)	By 2014, 4.5 % of all trips made by public passenger transport. (In 2001, 3 % of all trips to work were by public passenger transport.) Six-year targets (from 2007/08), developed after extensive evaluation and modelling: Ø a greatly improved appreciation and usage of the bus system derived from an increased quality and level of service Ø increased coverage: for households within the geographical limits of the city's bus system, 95 percent are within 500m walking distance of a bus stop (currently 87 percent) Ø increased patronage: a 75 percent increase in bus patronage compared to 2005, with at least a 40 percent increase in commuter trips by bus * reduced peak-hour load on the roading network: a 57 percent increase in the share of journey-to-work trips made into the central business district in peak time by public transport (from an estimated 5.6 percent in 2005 to 8.8 percent).	

Regional transport targets for sustainable transportation in New Zealand

TABLE A1: NZ REGIONAL TRANSPORT TARGETS--PUBLIC TRANSPORT			
Region	Source	Target	Comments
Northland	RLTS	Increase passenger transport patronage Efficient and reliable passenger transport Improved accessibility Connectivity and intergration between modes Reduced private car use in line with objectives of the NEECS	No specific target given
Hawkes Bay		* 2% of journeys to work to be undertaken by PT by 2016 (0.5% in 2006)	
Taranaki	RLTS	To improve the provision of passenger transport services in New Plymouth City. To improve the provision of passenger transport coverage in smaller rural communities and promote linkages in these communities with larger urban areas.	There are no specific targets included in the RLTS for Taranaki however there are policies included which can be read as targets. These have therefore been included in this spreadsheet for your information.
Southland	RLTS RPTP (2006)	*There will be an increase in the areas served by, and the frequency of, public transport services in Invercargill. *There number of bus passenger trips in Invercargill will increase over time. *The number of total mobility trips will increase over time. *There will be an increase in the percentage of Southland's population travelling to work via active transport modes and passenger transport. * Patronage levels on the Invercargill City scheduled bus services for FY 05/06 and onwards to equal or exceed 500,000 passengers pa.	No longer looks achievable in the short/medium term: patronage has declined from 515,000 in 04/05 to 446,000 in 06/07, 424,000 in 07/08 and estimated 400,000 in 08/09.
Tasman			
Gisborne	LTCCP -Levels of Service LTCCP -Levels of Service RLTS	% of customers that rate the passenger transport system as excellent/good (80%) the number of bus passengers per annum (123,861) Monitor the age cohorts of the patrons using public transport within the region	LTCCP -Land Transport and Parking increasing over the next 5 yrs
Nelson	Draft RLTS 2008 Draft RLTS 2008 Draft Regional Passenger Transport Plan 2008 Draft Regional Passenger Transport Plan 2008 Draft Regional Passenger Transport Plan 2008 Draft Regional Passenger Transport Plan 2008 Draft Regional Passenger Transport Plan 2008 Draft Regional Passenger Transport Plan 2008 Draft Regional Passenger Transport Plan 2008	*Increase share of weekday journey to work trips by public transport to at least 10% by 2018. (This is a stretched target). * 80% of households are within 400 metres (5 minutes walk) of a bus route by 2011. * 99% of all timetabled bus journeys are operated by 2011. * 95% of all timetabled bus journeys operate no earlier than 1 minute before and no later than 5 minutes after departure times as published in timetables by 2011. * Total exhaust emissions of the bus fleet are lower in 2011 compared to 2008 notwithstanding the service frequency is proposed to increase by over 200% in bus kilometres operated. * All express and secondary * bus services operate at least every 30 minutes (Monday to Saturday daytime**) by 2011. * Bus timetable information is easy to use and is widely available through multiple channels by 2011. * All bus drivers attend a customer service and disability awareness training course by 2011. * At least 33% of bus network costs are supported by the fare-box by 2018.	The next RLTC meeting is taking place on 8th August 08 where the committee is to consider agreeing the final version of the draft RLTS and proceed with public consultation. see above comment The next RLTC meeting is taking place on 8th August 08 where the committee is to consider agreeing the draft Regional Passenger Transport Plan and proceed with public consultation, together with the draft RLTS. see above comment see above comment see above comment see above comment see above comment see above comment see above comment
Marlborough			
Westcoast	RLTS (2006)	The West Coast does not have any passenger transport services except 3 taxi services located in each of the urban areas	

Appendix A

TABLE A2: NZ REGIONAL TRANSPORT TARGETS - 'ACTIVE' MODES: TARGETS & ACTIONS				
Region	Source	Target	Comments	Actions--Non-Pricing
Auckland	RLTS / Sustainable Tpt Plan	* 15.5% of all trips to be by active modes (2016)--2006 figure 15.1% *Walking and cycling trips in centres to increase by 63% 2001-2016	Expected result - model forecast based on implementation of RLTS strategy	School travel plans - ARTA, TAs to achieve a 9% reduction in car trips to school by 2014 Community based travel initiatives ARTA, TAs to achieve a 3% average reduction in local car trips made by 60,000 households 2016 Develop and implement education programmes to increase awareness of transport impacts and choices. Walking - Improvements in infrastructure / network in 18 town centres/intensifying areas by 2016
	Sustainable Transport Plan	* This cycling programme aims to achieve the Regional Land Transport Strategy (RLTS) target of increasing the number of cycle trips. Currently only around 1% of morning peak trips in Auckland are by cycle. This Cycling Action Plan seeks to increase that by at least a further 1% by 2016. (p.31 - also on p.10)		Cycling - Completion of 50% regional cycle network by 2016
Wellington	RLTS	*"Key outcome" (stretch) target 2016: 15% of all JTW trips by active modes (13% in 2005/06)	Equates to 15% increase in JTW active mode share	Short term: At least 12 workplace travel plans and 16 school travel plans by 2008/09; Long term: At least 37 workplace travel plans and 90 school travel plans by 2016 Schools: also promoting walking school buses (WSBs) and walking buddies; road safety skills training
	Draft Regional Walking Plan (April 2008)			Awareness campaign: Develop and implement a campaign to raise public aware of the full costs of their travel and mode choice decisions, including the environmental, social and economic costs
	Draft Regional Cycling Plan (Aug 2008) Regional TDM Strategy (Dec 2005)			Jo Hewitt: refreshing TDM implementation plan over next 6 months Improve/expand cycle network - ditto pedestrian (under investigation)
				Improve Cycling and Public Transport Integration e.g. bikes on trains and buses; parking facilities - ditto pedestrian access to trains
Canterbury	RLTS	*12% of all CHC UDS trips (excl walk) by cycle by 2011 (6% in 1996)	The Annual Monitoring Report (AMR) 06/07 reports (JTW data) cycling mode share reduced from 6% in 2001 to 5% in 2006--no progress was made towards the target. Walk mode share increased from 5% in 2001 to 6% in 2006.	Provide for the development of direct, safe and secure walking routes and networks based on identified walking desire lines, particularly in and around town centres, schools and local neighbourhoods and to public passenger transport. Encourage walking and cycling through travel behaviour change programmes, promotional and educational activities. Develop a regional cycle network to provide attractive connections between urban areas in Canterbury and links to adjoining regions; Seek to provide physically separated cycling facilities on the strategic freight network and busy arterial roads where demand for cycling warrants.
				Develop travel plans and travel behaviour change programmes with communities, schools and businesses.
Waikato	RLTS	No formal target been set	Hamilton urban target only Walking and cycling strategy in process of being developed	Implementation of school travel plans around the region (particularly in Hamilton with respect to easing traffic congestion); implementation of walking school buses around the region CBD commuter parking; school travel plans; Community and household travel plans; Walking school buses; Back to School programme; Transport Choices for Families trial; Know it, Live it Programme; High occupancy (HOV) lanes; Traffic calming Implementation of education/awareness initiatives with respect to travel demand management
	Hamilton Alternative to Rooding Transportion Study 2006 (HARTS)	11% mode shift from private vehicles in 2025		
	Draft Regional Walking and Cycling Strategy	Is due to be released in Nov 2008 and will have regional and sub-regional targets for each mode		Territorial authorities to implement travel demand management measures in the subregion, including the promotion of business and school travel plans (including walking school buses).
Bay of Plenty	RLTS	Stretch target - Tauranga 2011 - 4.0% cycling and 5.0% walking trips to work; Tauranga 2021 - 5.0% cycling and 5.5% walking trips to work; Rotorua 2011 - 4.0% cycling and 6.2% walking trips to work; Rotorua 2011 - 5.5% cycling and 6.5% walking trips to work.	Targets set in 2007 Strategy. Tauranga targets also included in Western Bay of Plenty SmartGrowth Strategy.	Strategic cycleway network - Cycle facilities on major commuting routes (development of standards and shoulder widening
				Provision of direct cycleways and walking links within new subdivisions

Regional transport targets for sustainable transportation in New Zealand

TABLE A2: NZ REGIONAL TRANSPORT TARGETS - 'ACTIVE' MODES: TARGETS & ACTIONS				
Region	Source	Target	Comments	Actions--Non-Pricing
Manawatu - Wanganui	RLTS	*20% of all JTW trips by active modes by 2016 (15% in 2001)	Considered realistic. 1986 Census level was 22% of all JTW by active modes.	Undertake a Region wide campaign to promote walking and cycling as a transport option for short trips (Horizons Regional Council, lead agency in partnership with Territorial Authorities) by end 2006.
	RLTS	*80% of all PN journeys to secondary schools by active modes by 2016 (68% in 1997)	Considered realistic. 90% of all secondary students in PN travelled to school by active modes No walking and cycling strategy	Investigate and trial the provision of cycle carriers on urban buses in Palmerston North and Wanganui (Horizons Regional Council) by end 2007. Develop and trial school travel plans in selected schools in Palmerston North and Wanganui, with a target of increasing trips to school by active modes and public transport by 20% over the trial period (Horizons Regional Council – lead agency, Palmerston North City Council and Wanganui District Council, SPARC, Public Health) by June 2007. Promote the use of urban design guidelines in all developments (Territorial Authorities) - ongoing.
				Identify a regional cycling network and develop an implementation plan (Horizons Regional Council, Territorial Authorities, Transit New Zealand) by end 2007.
Otago	RLTS	15 % of all trips to work made by walking by 2014. (In 2001, 12 % of trips were by foot).	No walking and cycling strategy	Encouraging safe cycling routes in all urban centres
	RLTS	6 % of all trips made by cycle by 2014. (In 2001, 3 % of total trips to work were made by cycle.)		Promotion of walking and cycling for short trips through land use planning, urban design, direct investment in quality footpaths, walkways and cycleways, and marketing of 'healthy transport alternatives'.
	RLTS	By 2014, all district plans include criteria for use in processing urban subdivision consents to ensure opportunities for walking, cycling and public transport are enabled and supported.		Reducing dependence on private vehicles through land use planning that enables local needs to be met locally, providing a high level of network 'connectedness' to promote non-vehicle modes, and using parking availability and price signals to shift behaviour.
Northland	RLTS	More facilities for pedestrians & cyclists	Walking and cycling strategy in process of being developed	Investigate, prioritise and implement a travel plan programme. A key priority is school travel plans in the Whangarei urban area and other key urban centres.
		Increased focus on needs of the disabled community Walking and cycling is continually increased	No specific targets given	Develop an ongoing education campaign to promote changes in travel culture in Northland to reduce the dependency on motor vehicles. (including promotion of cycling, walking and public transport). Develop more Cycle Facilities & Cycle Networks Investigate the establishment of safe, convenient, and continuous network of footpaths (with minimum number of intersections with vehicular carriageways) in order to link areas of high pedestrian generation.
		Increased cycle events in Northland		Identify and develop opportunities for the promotion of cycling and walking as viable modes of transport with a particular focus on: • Driver awareness campaigns of cyclist rights; (e.g. 'share the road' and pedestrian safety campaigns); • Support for national, regional and local events (e.g. National Bike Week); • Cycle training and skills programmes.
Hawkes Bay		* To progressively implement the district walking and cycling strategies through to 2011/12 * Increase in percentage of those cycling and walking to work in 2011 census over that of 2006 (9.6%).	No walking and cycling strategy	Ensure cyclists have adequate road space on key arterial routes, as identified in TLA walking and cycling strategies Travel Plans for large employers and institutions: progressively introduce travel planning to schools and major work places.
		Hastings has a cycling strategy (2001) and walking strategy (2004): • increase the number of recreational walkers by 20% by 2015 • increase the average distance walked by 50% by 2015 • increase the percent of employees walking to work by 20% by the 2016 Census • increase the percent of children walking to school by 20% by 2015		walking school buses (WSBs)

Appendix A

TABLE A2: NZ REGIONAL TRANSPORT TARGETS - 'ACTIVE' MODES: TARGETS & ACTIONS				
Region	Source	Target	Comments	Actions--Non-Pricing
Taranaki	Regional walkways and cycleways strategy for Taranaki 2007	<p>*To increase the proportion of people who choose to walk or cycle to work by 2011.</p> <p>*To increase the proportion of students who walk or cycle to school by 2010.</p> <p>*To increase the provision of walking and cycling infrastructure and funding over the next five years.</p> <p>*To achieve an improvement in the overall quality of walking and cycling facilities available each year.</p> <p>*To increase the awareness of appropriate designs for and implementation of cycling and pedestrian facilities through the region.</p>	<p>These are considered to be realistic targets as we did not want to include targets that we didn't think were achievable. Conversely we wanted something that we could strive for and looked at other national targets to get an idea how to do that.</p>	<p>Work with the Taranaki District Health Board, territorial authorities and Sport Taranaki in promoting the use of alternative more active modes of transport in the region.</p> <p>Develop engineering measures for targeted local roads which will encourage through traffic to use alternative routes which are more suitable for the purpose.</p> <p>Network development, e.g.: Encouraging the continued development and provision of walking and cycling tracks and routes on private land; Improving walking and cycling infrastructure to cater for users needs when preparing district plans, considering structure plans and planning for new urban developments, subdivisions, upgrading existing urban environments or as part of general road improvement projects; Ensuring walkway and cycleway networks are linked to appropriate rail, public transport facilities, state highway, local road developments, parks and recreational areas.</p> <p>Encouraging and aiding schools and businesses in promoting walking and cycling (walking school buses)</p> <p>Encouraging more people to walk and cycle instead of using the private motor vehicle for both utilitarian and recreational purposes</p>
		*To increase the level of cycle tourism throughout the region from 2006 levels.		
		<p>*To reduce private motor vehicle commuting to work by promoting alternatives (e.g. working from home, passenger transport, carpooling, walking and cycling).</p> <p>*To decrease the number of cyclists and pedestrian injuries and fatalities in Taranaki by 2010.</p>		
		*To reduce the perception of non-cyclists that think cycling is dangerous or very dangerous.		
Southland	RLTS and draft Southland Active Transport Strategy.	<p>*There will be an increase over time in the length of cycle facilities in Invercargill and in other parts of the region.</p> <p>*Cycle counts on selected routes in Invercargill will increase over time.</p> <p>*Pedestrian counts at selected sites in Invercargill will increase over time.</p> <p>*There will be an increase in the percentage of Southland's population travelling to work via active transport modes and passenger transport.</p>	Same targets in the RLTS and draft Southland Active Transport Strategy	<p>Several TDM-related policies e.g. "To the extent that is practical, give priority to facilities for pedestrians, cyclists and public passenger transport in managing traffic" followed by descriptions of the kind of action that could be taken (in this case, various forms of travel plans) but no specific commitments to action.</p> <p>Encourage businesses and educational institutes to provide suitable facilities and/or services to enable users of those places, including employees, to travel by a range of travel modes. (No actions provided)</p>
Tasman	RLTS 2003 Walking and cycling strategy	*None specified		<p>Identify and designate strategic roading/pedestrian/cycle routes to secure land transport links; network planning & development, etc</p> <p>Install cycle parking facilities that encourage use or where there is high demand or an identified need.</p>
				Ensure network improvements are constructed to appropriate carriageway standards including consideration for pedestrians and cyclists in accordance with the Pedestrian and Cycling Strategy.
Gisborne	RLTS Walking and cycling strategy for the Gisborne District, 2005 LTCCP-Levels of service	<p>*10% increase in numbers of participants walking and cycling as a mode of transport to work and to school</p> <p>*</p>		<p>Invest in travel demand management measures targeting schools and central Gisborne – up to \$40k per year</p> <p>Identify, and develop implementation programme for, areas where speed limiting, traffic calming and/or traffic volume reduction, in conjunction with the traffic management strategy, would provide effective improvements to safety and amenity levels for cyclists and walkers.</p> <p>Continue to develop Walking and Cycling projects – \$50,000 is allocated annually; Implement footpath improvements - \$50,000 is allocated to improve footpaths and mobility annually; Complete City to Wainui Cycleway/walkway by 2008. Target for 13.5km of new cycle network.</p> <p>Develop a co-ordinated plan to promote the existing cycle and walkways facilities and the health benefits of using them.</p>
				Develop a co-ordinated strategy with Transit NZ and schools within the city to provide for the safe passage of cyclists from the eastern side of Gisborne City to the schools on the Western side

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TABLE A2: NZ REGIONAL TRANSPORT TARGETS - 'ACTIVE' MODES: TARGETS & ACTIONS				
Region	Source	Target	Comments	Actions--Non-Pricing
Nelson	Draft RLTS Oct 2008	<p>* Develop a programme of area specific studies into the barriers to walking and cycling by 2010, initially focussing on the heavily trafficked arterial and principal roads.</p> <p>All subdivisions and developments to include provision for walking, cycling and provision for public transport</p> <p>* Develop local road upgrade design methodology to improve streetscapes, by 2010.</p> <p>*Increase share of week day journey to work trips undertaken by walking and cycling to at least 25% by 2018</p>	<p>The next RLTC meeting is taking place on 8th August 08 where the committee is to consider agreeing the final version of the draft RLTS and proceed with public consultation. In addition to the RLTS targets the Council's Pedestrian Strategy 'Stepping Out' and the Council's Cycling Strategy 'Pedalling Along' set out a number of detailed actions and monitoring requirements.</p>	<p>Introduce school / college travel plans</p> <p>Promote alternative forms of travel through media publicity campaigns, promotional events and information packs</p> <p>Introduce "TravelSmart" programme – provision of information on alternative travel modes and methods on an individual household basis</p> <p>Integration/ network development, e.g. promote the co-location of urban developments which reduce the overall demand for travel and which are conveniently located to bus, walking and cycling networks through intensification and mixed use developments and deter developments which adversely impact on the efficiency of transport routes</p> <p>Develop cycling network, e.g. providing lanes in specified areas; improving existing lanes & associated infrastructure, etc.</p> <p>Implement an end of route cycle provision programme including cycle stands and lockers with major employers.</p> <p>Investigate the possibility of installing shelters over existing cycle stands; Provision of secure school cycle storage will be further implemented; CBD cycle storage to be investigated</p>
	NCC Travel Demand Management Strategy	<p>All schools to have School Travel Plans by 2016</p> <p>5% of households in NCC to be contacted to offer TravelSmart services annually (beginning after commissioning of new public transport services).</p>		
	NCC Cycling Strategy	<p>At least a 10% increase in cycle use levels, shown in the proposed 2011/12 comprehensive cycle use survey compared to the proposed 2007/08 survey</p> <p>An increase in cycling's proportion of journey to work from 7.1% in the 2001 Census, to at least 10% in the 2011 Census</p>		
		Increase numbers cycling to school city-wide, and for individual schools to promote exercise and reduce traffic congestion		
Marlborough	RLTS 2007			<p>Develop a safe, convenient and attractive travel network for walking and cycling - number of infrastructure projects</p> <p>Ensure adequate provision is made within the State Highway network to cater for cyclists and pedestrians where required</p> <p>Several proposed 'actions' to encourage walking & cycling, but no specific plans or funding commitments (2005 Action Plan, most recently available on internet)</p>
	Walking & Cycling Strategy	<p>To increase the proportion of commuter trips (as recorded in Census "Travel to Work" data) made by walking beyond 10% in 2011. (This was the level in 1996 and 2001.)</p> <p>To arrest the decline in the proportion of commuter trips (as recorded in Census "Travel to Work" data) made by cycling, so that at least 6% of trips to work are made by cycle in 2011. (This was the level in 2001 and was preceded by a steady decline from 15% in 1986.)</p> <p>To increase the proportion of trips to and from school made by walking and cycling annually from a 2005 base of 20% by walking and 18% by cycling, and to report annually on progress.</p>		
		To increase the length of on-street cycle lanes, wide road shoulders or off-street cycle paths by at least 6 km (for example, cycle lanes on both sides of a 3 km stretch of road) each year and to report annually on progress.		
Westcoast	RLTS (2006)	<p>Targets for 2014:</p> <ul style="list-style-type: none"> * 12% of journeys to work made by walking * 5% of journeys to work made by cycle * Increased use of walking and cycling for short trips. * Where appropriate, support the development of cycle/walkway routes * Have appropriate District Plan and other mechanisms in place to enable consideration of all transport modes. * Encouragement of good urban designs to provide safe and direct connectivity for walking and cycling. 	West Coast Walking & Cycling Strategy currently being drafted.	<p>Make greater provision and use of low energy transport options through encouragement of safe and attractive walking and cycling environments.</p> <p>Promotion of walking and cycling for short trips through land use planning, urban design, direct investment in quality footpaths, walkways and cycle ways, and marketing of 'healthy transport alternatives'.</p>

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TABLE A3: NZ REGIONAL TRANSPORT TARGETS - 'ACTIVE' MODES: MEASURES & TRENDS			
Region	Source	Performance Measures	Trend Results
Auckland	AMR 2007	NZHTS data - not used in 2007 report JTW Census information (1991,1996, 2001, 2006) Cycle counts	Decline from 1991-2001; stabilised in 2001; absolute number of walkers increased 28%, while absolute number of employed increased by 18%. Integrated and standardised regional cycle monitoring commenced for the first time in March 2007. This monitoring occurred at 69 sites across the region. A total of 4,358 cyclist movements were recorded across the 69 sites in the morning peak period (between 6.30 am and 9.00 am). Comparison of the 2007 survey with data from Auckland City sites where the same cycle count methodology was used in previous years shows a 7 per cent increase in cyclists.
Wellington	AMR 2006/07	JTW - combined walking/cycling Wellington CBD cordon cycle and pedestrian counts (2000-2007- March each year): • Pedestrians in- and outbound to/from the central city during the morning peak period (AM cordon) • Cyclists in- and outbound to/from the central city during the morning peak period (AM cordon) • Cyclists at suburban locations during the morning peak period: Newtown, Kilbirnie, Kelburn, Thorndon, Ngaauranga (AM commuter) • Pedestrians along the Golden Mile during lunchtime (Golden Mile midday) • Pedestrians between the CBD and waterfront during lunchtime (across waterfront midday). Active modes for short trips - GW 'short trip active modes survey' - 2004; 2006; next 2009	Upwards - figure given 13%+ (CEO calculation 12.4%) Cyclists 'commuting' show definite upward trend (but lots of fluctuation) - more than doubled since 2000; pedestrians crossing cordon also increased slightly overall No change
Canterbury	AMR 2006/07	JTW Census information (1991,1996, 2001)	Decline
Waikato	AMR 2006/07	JTW Census information (2001, 2006)	
Bay of Plenty	AMR 2005/06	JTW Census	
Manawatu - Wanganui	RLTS	High school cycling (1984 and 1997) JTW Census information	Decline Decline
Otago	RLTS	JTW Census information SPARC Physical activity survey	No trends reported No AMR available
Northland	2007 State of the Environment Report	JTW Census information (1996-2006)	Decline
Hawkes Bay	RLTS	JTW Census information	Decline
Taranaki	RLTS Regional Walkways & Cycleways Strategy	JTW Census information JTW Census information NZ Household Travel Survey - mode share (1989/90 & 1997/98)	Decline Decline
Southland	2007 AMR	JTW Census information	Decline
Tasman	RLTS Regional Walking & Cycling Strategy (2005)	JTW Census information Bike counts at schools (2003)	Decline No trend established (yet)
Gisborne	RLTS Walking & Cycling Strategy for the Gisborne District	Nothing on quantity of walking or cycling activity	
Nelson			
Marlborough	Walking & Cycling Strategy	JTW Census information School walking & cycling data - Council survey	
Westcoast	AMR 2007	Nothing on quantity of walking or cycling activity	

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TABLE A4: NZ REGIONAL TRANSPORT TARGETS - GHG, VKT, SOV					
Region	Source	Target	Comments	Non Price Strategies	Pricing Strategies
Auckland	RLTS (Chp 8 TDM)/Sustainable Tpt Plan (Table 1.2 p 6)	<p>*Reductions in car trips (targets for the diversion of vehicle trips to other choices) 2006-16:</p> <ul style="list-style-type: none"> -9% car trips to school -12% car trips to education in selected organisations - 3% car trips from targeted households <p>The overall target is to reduce the number of vehicle trips each morning peak by 20,000. This will halve the anticipated increase in vehicle traffic on Auckland's roads.</p> <p>At least a 20% reduction in emissions to air which are harmful to health</p> <p>CO2 emissions from the transport system are likely to increase by 22% by 2016.</p> <p>Relative to current levels, emissions to air from transport are expected to change as follows: reduce NOX emissions by 21%; PM10 emissions by 23%; reduce VOC emissions by 54%.</p>	<p>RLTS targets based on 'expert assessment' (TDM Technical paper attached). Conservative targets based on local and international experience with similar TDM measures, but tempered by fact that the measures were new to Auckland.</p> <p>Refer ARTA Workplace Travel Plan reports re progress to date. The specific targets from the RLTS set out in Table 1.2 are based on Auckland travel patterns, predictions of achievable success levels based on local and international experience, and 2016 projections population, employment and school and tertiary rolls.</p> <p>Obviously not a stretch target (but still significantly less than if the strategy was not implemented)</p> <p>A public health target rather than an environmental target.</p>	<p>Centre based travel plans - ARTA, TAs Achieve a 12% average reduction in car trips to work/study in organisations totalling 90,000 employees/students by 2016</p> <p>Support technology improvements which reduce the need to travel.</p> <p>Support initiatives that encourage ridesharing, teleworking and flexible work hours.</p>	<p>Support the development of the region's public transport and active mode outcomes through appropriate parking policies and measures. This includes parking measures to influence the travel decisions of commuters through pricing and the planning and management of parking supply.</p> <p>Current RLTS is to evaluate road pricing - look at implementation impact</p>
Wellington	RLTS	<p>*2016 'key outcome' (stretch) target for CO2 emissions to be no more than 1065kTpa (5% below 2005/06 level of 1118 kTpa)</p> <p>*2016 target for JTW travel by private vehicle to not exceed 62% of all work trips (68% in 2006)</p> <p>*2016 regional fuel use in 2016 to not exceed 442 Mlitres (95.7% of 2006 level)</p> <p>*2016 AM peak average vehicle occupancy for vehicles entering the WGN CBD (AM peak 2 hours, inbound) to be at least 1.50 (1.37 in 2005)</p> <p>*2006 VKT/GDP ratio to reduce by 2016</p>	<p>Represents a 27% reduction in BAU forecasts of 2016 emissions.</p> <p>AMR 06/07 notes that general occupancy trend has been downwards since at least year 2000.</p> <p>AMR 06/07 notes that state highway VKT/GDP has shown some decline over recent years (by 6% 2002-2006)</p>	<p>Short term: road pricing study completed</p> <p>Medium to long term: road pricing legislation introduced</p>	
Canterbury	RLTS (2008-2018)	<p>* Region-wide 2011 CO2 to be no more than 10% above 2001 levels</p> <p>*CHC UDS reduce the proportion of single occupant motor vehicles in peak periods, by 2011</p>	<p>AMR 06/07 notes that CO2 emissions are decreasing towards the target (by 6% in 2006)</p> <p>AMR 06/07 notes some improvement towards this target (a reduction of 4% in the proportion of single occupancy vehicles from in 2007 compared with 2003). 'Target' is, however, rather vague!</p>	<p>Encourage more efficient motor vehicle use through improved logistics and programmes that increase vehicle occupancy or reduce the demand for travel.</p> <p>Use planning and parking management methods, to reduce the total space taken by parking in city and town centres and major new developments.</p> <p>Promote the location of housing, jobs, shopping, leisure, education and community facilities and services to support sustainable transport choices and reduce the need to travel, especially by private motor vehicle.</p> <p>Design and programme developments and related infrastructure to support sustainable transport choices, improve interchange between modes and to reduce the need to travel, especially by private motor vehicle.</p>	<p>Use parking management methods including pricing, to reduce travel by car in congested areas and where greater use of alternative modes is desirable.</p> <p>Undertake a preliminary study and raise public awareness of road pricing options.</p>
Waikato	Access Hamilton Strategy LTCCP	<p>Reduce congestion by managing traffic growth to less than the rate of population growth, halving traffic growth to 1.5% pa.</p> <p>Benzene concentration in Hamilton lower than results from previous year</p>	<p>Hamilton urban target only</p>	<p>Support the development of land use planning tools (district plans, structure plans) that reduce traffic demand and provide for a range of alternative transport modes; regional growth strategy</p> <p>Implementation of business/corporate travel plans and car-pooling initiatives (particularly in the Hamilton, Waikato and Waipa sub-region)</p> <p>Parking supply management</p> <p>Encouragement of teleworking, telecommuting (including working from home) and car-pooling policies to reduce peak flow traffic in Hamilton</p>	<p>Implementation by territorial authorities of parking pricing policies</p> <p>Investigation of road pricing methods such as tolling opportunities on key strategic corridors</p>
Bay of Plenty		<p>No targets.</p> <p>Performance indicator-Vehicle occupancy: Proportion of drivers amongst those who travelled to work by car, truck or van</p>		<p>Central area parking strategy - The management of parking supply to reduce demand for car trips and increase walking, cycling and use of public transport.</p> <p>Promotion of ride share, and school (including WSBs) and workplace travel plans</p>	<p>Investigate road pricing as part of suite of tools</p>
Manawatu-Wanganui	RLTS	<p>No targets set for these but have VKT and SOV data for baseline info.</p>		<p>Develop and trial workplace travel plans in appropriate organisations in urban areas with a target of increasing trips to work by active modes and public transport by 20% over the trial period (Horizons Regional Council – lead agency, Palmerston North City Council and Wanganui District Council, SPARC, Public Health) by June 2008.</p>	<p>Investigate the role of parking supply and parking charges as a means of managing travel demand in Palmerston North through the development of a parking strategy (Palmerston North City Council).</p>

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TABLE A4: NZ REGIONAL TRANSPORT TARGETS - GHG, VKT, SOV					
Region	Source	Target	Comments	Non Price Strategies	Pricing Strategies
Manawatu-Wanganui continued				Undertake a region-wide education campaign to promote the use of alternative modes of transport, encourage more efficient use of vehicles and promote ways to reduce the need to travel (Horizons Regional Council, Territorial Authorities) by end 2007.	Complete the trial of the Massey Unlimited Access Scheme (Horizons Regional Council, Massey University) in order to determine the effects of parking pricing and free public transport on travel behaviour (Horizons Regional Council, Massey University) by February 2007.
Otago	RLTS RLTS RLTS RLTS RLTS	By 2014, contain network wide carbon dioxide emissions to no more than 10 % above 2001 levels. By 2014, increase the peak period travel share of modes other than single occupancy private motor vehicles in Queenstown and Dunedin. By 2014, have appropriate District Plan and other mechanisms in place to assist in limiting transport demand. By 2014, reduce peak hour motor vehicle travel from 2004 levels by organisations or suburbs where demand management programmes are applied. By 2014, reduce heavy vehicle share of total vehicles count on strategic routes.			
Northland	RLTS	Cleaner emissions and more fuel efficient vehicles Reduced private vehicle usage Reduced effects from noise and vibration Reduced discharge originating from transport infrastructure Greater use of rail	No specific targets given	Develop a parking management strategy for Whangarei to assist in the reduction of congestion. Support the development of e-learning centres and high speed internet access (Broadband), thus lessening the need to travel.	
Hawkes Bay					
Taranaki	RLTS Regional walkways and cycleways strategy for Taranaki 2007	To reduce traffic demand, greenhouse gas emissions, fuel consumption and road congestion through the increased use of alternative modes of transport. To improve alternative transport options therefore providing the community with greater choice when deciding how to travel and improve regional efficiency. To reduce the reliance on private motor vehicles in the region, particularly for short trips. To increase understanding and awareness of available travel demand management techniques. To reduce reliance on private motor vehicles by promoting travel demand management measures (such as carpooling).	There are no specific targets included in the RLTS for Taranaki however there are policies included which can be read as targets. These have therefore been included in this spreadsheet for your information.	Implement parking restraint methods in areas where the greater use of alternative modes is desirable. Encouraging businesses to promote walking and cycling within their organisations (by providing appropriate facilities e.g. showers and cycle storage)	Develop parking policies which oppose incentives for businesses to relocate away from town centres.
Southland		No targets for this aspect currently.	At the time, it was considered appropriate that this aspect be reported on at a national level.		
Tasman	Walking & Cycling Strategy			Develop an incentive programme reducing the need for car parking for those employers who actively support cycling and walking at work. Land use planning and urban design that complements the use of cycling and walking as a viable option for commuters.	
Gisborne		Not included in RLTS or LTCCP	Promote and encourage flexibility in work environments to enable staff to avoid peak traffic times if cycling, running or walking as a mode of transport – GDC to lead by example.		
Nelson	Draft RLTS October 2008 Draft RLTS October 2009 Draft RLTS October 2010 NCC Travel Demand Management Strategy NCC Travel Demand Management Strategy	* Increase the number of vehicles with more than one occupant in the peak period across the Waimea Road / Rocks Road screenline to at least 10% by 2018. * Reduce emissions to air from the transport sector by 2018 from values recorded in 2006. * Reduce Nelson's greenhouse gas emissions from the transportation sector 2001 levels by at least 40% in 2020. 100% of workplaces with more than 50 staff to have Workplace Travel Plans by 2016 Car pooling scheme to have 200 registered users by 2016	Public consultation closes 14 Nov 2008 See comment above See comment above	Introduce business travel plans (for businesses with >50 employees) - TDM Strategy says >100 employees Investigate viability of improving infrastructure which would encourage teleworking Expand car-pooling /parking priority scheme - Expand car-pooling for those areas not encompassed by public transport Develop parking policy to deter long-stay commuter parking in central areas	Commission an investigation of the available road pricing technologies, their application to Nelson and potential impacts Investigate the application of Regional Fuel Tax in Nelson
Marlborough					
Westcoast	RLTS (2006)	Targets for 2014: * Contain network wide carbon dioxide emissions to no more than 10% above 2001 levels.	Aspirational as limited modal alternatives available	Promote more efficient motor vehicle use through the implementation of Business Travel Plans. Reducing dependence on private vehicles through land use planning that enables local needs to be met locally, providing a high level of network 'connectedness' to promote nonvehicle modes, and using parking availability to shift behaviour.	

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TABLE A5: NZ REGIONAL TRANSPORT TARGETS - TRAVEL TIME/RELIABILITY			
Region	Source	Target	Comments
Auckland	RLTS	<p>*Target performance changes 2006-2016:</p> <ul style="list-style-type: none"> - Inter-peak travel times to decrease by 5.6% -Average speeds to port to decrease by 9% and airport by 8% in morning peak -PT travel times CBD-Aiport to decrease by 33% -Excessive delays for personal travel will be avoided -Travel time variability will reduce 	Expected result - model forecast based on implementation of RLTS strategy.
Wellington	RLTS	<p>*Target performance changes 2005/06-2016:</p> <ul style="list-style-type: none"> - No decrease in average speeds for key routes (55km/hr in 2006) - Key routes are rarely affected by closure - Congestion <21s per km on selected routes (20s in 05/06) - Improved journey time for freight between key destinations - Peak period PT times are not more than for car in selected corridors - Nearly all PT services run on time 	
Canterbury	RLTS (2008-2018)	<p>*Christchurch City /urban area targets 2011:</p> <ul style="list-style-type: none"> - No congestion outside peak periods - No more than 40 congested lane km within peak periods. <p>* Targets in other parts of region 2011:</p> <ul style="list-style-type: none"> - No traffic congestion - Min level of service E/D 	<p>AMR 06/07 notes that traffic continues to increase but congestion is not considered an issue.</p> <p>This target will change as part of the next RLTS review - it is acknowledged that it is not measureable</p> <p>AMR 06/07 notes that traffic growth is increasing slowly, but congestion is not considered an issue by significant numbers of the Canterbury population.</p>
Waikato	Access Hamilton Strategy RLTS	<p>Reduce congestion by managing traffic growth to less than the rate of population growth, halving traffic growth to 1.5%</p> <p>Waikato Expressway projects substantially completed in 2025</p>	Hamilton urban target only
Bay of Plenty		No targets.	
Manawatu-Wanganui		No formal targets in this category	
Otago	RLTS RLTS RLTS RLTS RLTS	<p>* Minimum road LoS target 2014:</p> <ul style="list-style-type: none"> - Strategic non-urban D peak, other times C - Dunedin and Queenstown CBD peak E, other times C - Remainder peak C, other B <p>By 2014, no congestion within Queenstown or Dunedin City outside peak periods (7-9am and 4-6pm); congestion is defined as worse than the recommended minimum level of service set out in RLTS Appendix 5.</p> <p>By 2014, contain the amount of congested roads within Queenstown during peak periods to 2 lane kilometres or less (2001 = 1, predicted 2014 = 3).</p> <p>By 2014, contain the amount of congested roads within Dunedin City during peak periods to 3 lane kilometres or less (2001 = 2, predicted 2014 = 4)</p> <p>By 2014, reliability and security of service of regional routes (e.g. Nevis Bluff, Kilmog Hill, Manuka Gorge).</p>	
Northland	N/A	None	

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TABLE A5: NZ REGIONAL TRANSPORT TARGETS - TRAVEL TIME/RELIABILITY			
Region	Source	Target	Comments
Hawkes Bay		* Improved levels of service on all Hawkes Bay roads * Provide identified routes for freight traffic accessing the Port of Napier	
Taranaki		None	No targets included in RLTS
Southland	RLTS	*Passing opportunities to improve (passing lanes every 5km on those parts of the strategic roading network where traffic volumes exceed 4,000 vehicles per day and otherwise where traffic volumes are between 2,000 and 4,000 vehicles per day and there are inadequate passing opportunities due to terrain). *The number of network disruptions/closures of more than 12 hours on strategic routes (e.g. as a result of a natural hazards/disasters or major crashes) will decrease over time. - Closures of more than 12 hrs on strategic routes to decrease	
Tasman			
Gisborne	LTCCP	Average travel time between 6 nominated routes of equal travel time. Maximum of 30 minutes over the next 5 yrs	Levels of Service
Nelson	Draft RLTS 2008	* Improve average peak hour travel time delays by 10% by 2018 from values recorded in 2008.	The next RLTC meeting is taking place on 8th August 08 where the committee is to consider agreeing the final version of the draft RLTS and proceed with public consultation.
Marlborough			
Westcoast	RLTS (2006)	Targets for 2014: * A fully developed network of passing bays/lanes on the State Highway and recognised heavy transport routes. * Ongoing investments to improve the reliability and security of service of regional routes. * Ongoing investment to improve the reliability and security of critical road and rail bridges.	Passing Opportunity Strategic Study under development 2008/09 (State Highways). SH6 Route Security Strategic Study under development 2008/09

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TABLE A6: NZ REGIONAL TRANSPORT TARGETS - ROAD SAFETY			
Region	Source	Target	Comments
Auckland	RLTS	*Target performance changes 2006-2016: - Injury crash rates reduced by 6% - Crashes to be reduced for pedestrians and cyclists Target: By 2010 there will be 408 or fewer fatal and serious crashes compared with 561 recorded in 2006. Goals: The Auckland region leads the country in road safety by achieving the lowest rate of regional road casualties per 10,000 people and per kilometre travelled by 2010. Speed-related road fatalities and injuries within the Auckland region decline from the five-year annual average (2002 to 2007) of 37 deaths and 734 reported casualties. Alcohol-related road fatalities and injuries within the Auckland region decline from the five-year annual average of 30 deaths and 699 reported casualties. Pedestrian deaths and injuries within the Auckland region continue to decline from the five-year annual average of 12 deaths and 363 reported casualties. Motor-vehicle-related deaths and injuries at intersections within the Auckland region decline from the five-year annual average of 17 deaths and 1,377 reported casualties. Motorcyclist fatalities and injuries within the Auckland region decline from the five-year annual average of 8 deaths and 260 reported casualties. Cyclist fatalities and injuries within the Auckland region decline from the five-year annual average of 1 death and 194 reported cyclist casualties. The percentage of unrestrained motor-vehicle-drivers killed or seriously injured declines based on the five-year annual average of 18%, and more than 95% of all motor vehicle occupants (including children) continue using approved restraints. Passenger transport promotion and safety initiatives contribute to an overall reduction in transport-related deaths and injuries.	Expected result - model forecast based on implementation of RLTS strategy.
Wellington	RLTS	* 'Stretch' targets 2016: - No crash fatalities due to road network deficiencies * 2016 targets: - Fewer than 100 pedestrians injured (150 in 2005) - Fewer than 75 cyclists injured (112 in 2005)	
Canterbury	RLTS (2008-2011)	* Regional targets for 2011: -Reduce deaths from road crashes to six or less per 100,000 of population -Reduce deaths + hospitalisations to less than 560 per year	AMR 06/07 notes a decrease in the number of deaths from road crashes down to 6 per 100 000 people. This meets the target, but 07/08 was a bad year - back up above 10.
Waikato	RLTS	Road safety targets for 2011 -Reduce deaths + hospitalisations to less than 380 per year	
Manawatu-Wanganui	RLTS	*Decrease in deaths (no more than 28) and hospitalisations (no more than 272) pa by 2010	These are the regional 2010 safety strategy figures. At current rates we are not likely to achieve these consistently, although 28 deaths has been achieved once in the past three years. Current data available from LTNZ Road Safety Issues reports
Otago	RLTS	* Targets for 2014: - Achieve 2010 safety strategy (18 deaths, 900 injuries & 2 ped deaths in 2004) By 2014, vehicle passing opportunities on average every 5km along State Highways, 1, 6, 8, 83 and 93. By 2014, safer driving conditions through sealing of key tourist routes. By 2014, improvement to safety of approaches to current one lane bridges. By 2014, avoid road crashes causing death or serious injury. By 2014, maintain a level of service memorandum with Police in relation to minimising closure times after accident events.	
Northland	RLTS	Reduction in road traffic crashes	No specific targets given
Hawkes Bay		* A decrease in the number of fatalities and casualties in the period 2006-2016 compared with the previous ten years.	
Taranaki	Roadsafe Taranaki Annual Plan	* Our target for walking school buses for the 08-09 year is: South Taranaki schools (15 Walking School Buses) 3 Stratford schools (10 WSB) 10 New Plymouth schools (40 WSB) * The number of drink drivers is reduced - At least 200 people complete the fatal vision programme - Compulsory breath testing shows decline in recidivist drink drive offenders - Attend at least 3 SADD managed events - Fund at least 4 students to attend SADD annual conference * The number of loss of control crashes declines - A minimum of 150 participants in Holden advanced driving courses in 2008/09. The number of speed relating crashes reduce. *Speed infringement notices within urban areas decline.	These targets have been set by the Road Safe Taranaki Group. There are no targets on road safety in our RLTS.

Appendix A

TABLE A6: NZ REGIONAL TRANSPORT TARGETS - ROAD SAFETY			
Region	Source	Target	Comments
		<ul style="list-style-type: none"> *The number of vehicles removed from police from the road due to defects and poor maintenance declines. *Visit a minimum of 10 schools through Bikewise week. - There is a perceived increase in the percentage of cyclists wearing their helmet correctly. - There is a perceived increase in the use of high-visibility equipment and lights by cyclists and pedestrians. - The number of road crashes involving vulnerable road user's decreases. - Roadsense school survey shows a perceived reduction in the number of vehicles dropping off and picking up students around schools. - A perceived increase in the number of pedestrians and cyclists coming into New Plymouth CBD. *Increased number of students using walking school buses. - The number of road safety campaigns actively supported by schools increases. - Students take a lead role in promoting road safety initiatives that are targeted at young people. - Students are seen to be actively encouraging safer driving habits among friends and family. - At least 150 young road users participate in practical driving courses. - Evaluations show a minimum of 85% of courses were beneficial and helped improve driver skills. - The Patea driver licensing programme is established with objective to become self sufficient and sustainable by the end of 2009. - The number of road crashes involving young road users decreases. - There is an increase in contacts to Roadsafe Taranaki initiated by young road users. * The Road Safety Coordinator supports ACC delivery of at least two fatigue related workshops. - Distributed fatigue literature to at least 10 companies. - Motorists fatigue awareness levels increase as reported by ACC from fatigue stop records. Reported fatigue incidents reduce. *50 people will be education on correct restraint use and fitting. - Roadsafe Taranaki staff pass appropriate training course. - The percentage of correctly fitted restraints increases. - The number of infringements issued for motorists not wearing their seatbelt decreases. 	
Southland	RLTS	<ul style="list-style-type: none"> * By 2010, no more than 110 fatalities + hospitalisations each year resulting from crashes on Southland roads. * Decrease in the number/proportion of intersection crashes on Southland roads. * Decreases in pedestrian/cycle casualties on Southland roads, relative to total number of pedestrian and cyclists. * Decrease in number/proportion of injury crashes on Southland roads due to speed/speed too fast for conditions, alcohol, fatigue, overseas visitors. * Seat belt wearing rates to increase over time and be better than the national average. *Number of crashes on Southland railways will decrease over time. 	
Tasman			
Gisborne	RLTS RLTS RLTS	<ul style="list-style-type: none"> By 2007 reduce the number of pedestrian and cycle injuries within the region by 20% Reduce the 2004 deaths plus hospitalisations figure from motor vehicles crashes of 70 per year, to no more than 54 per year by 2010 By 2010 achieve crash rates on urban local roads and rural state highways similar or better than other like regions and averages for all of NZ 	
Nelson	Draft RLTS 2008	<ul style="list-style-type: none"> * Reduce the total number of reported injury casualties by at least 20% by 2018 compared to 2008. * Reduce the number of injury pedestrian and cyclist casualties by 10% by at least 2018 compared to 2008. * Reduce the number of crossing / turning injury crashes by at least 30% by 2018 compared with 2008. * Reduce the number of rear end / obstruction injury crashes by at least 30% by 2018 compared to 2018. * Reduce the number of loss of control on bends injury crashes by at least 30% by 2018 compared to 2008. * Reduce the number of alcohol related crashes by 30%. * Reduce the number of motorcycle crashes by 30% * Assess perceptions of personal safety and security in the Nelson City Council annual survey. 	
Marlborough			
Westcoast	RLTS (2006)	<ul style="list-style-type: none"> * Targets for 2014: - By 2010 reduce the 5 year average of deaths per year from road crashes to 5. - Reduce deaths and hospitalisations from road crashes to 70 or below by 2010 - Implementing safety management systems in each territorial authority. - Safer driving conditions and amenity through continuous improvements to key tourist and freight routes, and glacier roads. - Improvement to safety of approaches to current one-lane bridges. 	

Appendix B: Development of PT targets

The process for establishing 2015 public transport (PT) targets for each region/urban area and the resulting targets are set out in section 2.3 of the main report and table B1 in this appendix.

The following provides additional comments to explain and amplify the material in the tables.

- Tables B1 and B1.1 show, for each region/urban area served by public transport, the:
 - actual patronage (boardings) and boardings/capita for 2007/08
 - growth rate in boardings/capita 2000/01–2007/08
 - patronage targets for 2015/16, expressed in terms of total boardings and boardings/capita
 - corresponding patronage growth rates 2007/08–2015/16, in terms of total boardings and boardings/capita
 - summary of key policy measures included in regional transport plans (principally regional land transport strategies and regional passenger transport plans) that would make significant contributions to achieving the proposed targets
 - consultant comments relating to the development of the targets for each region/urban area
 - main urban area population statistics for years 2000/01, 2006/07, 2007/08 and 2015/16 forecasts based on Statistics NZ medium forecasts).
- At an aggregate (national) level, it should be noted that the 2015/16 target in table B1 is for 174.3 million boardings: this will require an average growth rate in total boardings from 2007/08 of 4.9% pa, or in boardings/capita of 3.9% pa. This aggregate target is substantially greater than the 2008 *Government policy statement* (GPS) national target for a 2.8% increase from 2007/08, or a 1.8% pa/capita increase. The higher target than that in the GPS reflects the views of the larger population regions in particular, that these higher targets should be achievable. It is notable that target increases in patronage in Auckland alone (30.7 million boardings pa increase from 2007/08), which is based on modelling work of the Auckland Regional Council and the Auckland Regional Transport Authority and the Ministry of Transport's review of the Auckland Transport Strategic Alignment Project, is slightly greater than the total national GPS target increase (a 29.2 million boardings pa increase from 2007/08). The percentage target increases in most of the other six largest regions (in PT usage terms) also substantially exceed the GPS national average target.
- For some of the smaller regions, for which there is limited available information and detailed discussions were not held with local authority staff, a 'default' target of a 1.8% pa/capita patronage increase has been adopted. This is equal to the average rate of increase/capita required to meet the GPS national target.
- It should be noted that the targets given in table B1 are the draft targets discussed at the October 2008 workshop. Subsequent to this, some regions, for example Greater Wellington, have indicated that they aim to have a more ambitious target than that shown here.

Appendix B

TABLE B1: PT PATRONAGE TARGETS--SUMMARY BY REGION										
Region	CURRENT/HISTORIC PATRONAGE				TARGET PATRONAGE					Key Policy Measures included
	07/08 Trips		00/01-07/08		15/16 Trips		07/08-15/16			
	Total Mpa	Cum % Nat Total	Per Cap	Trips/cap %pa	Total Mpa	07/08 Mpa	Per Cap	Tot Trips %pa	Trips/cap %pa	
Auckland	54.34	46.7%	41.7	1.9%	85.00	30.67	57.8	5.8%	4.2%	Major rail system investment, bus network restructure, increased bus service levels, upgraded bus VQS, bus priorities, IFT, comprehensive RTI. TDM measures.
Wellington	34.69	76.5%	82.8	1.5%	42.19	7.50	95.3	2.5%	1.8%	Major rail system upgrade (esp R/S), upgraded bus VQS, expanded P&R, extended bus priorities, IFT, i/change impts, comprehensive RTI. TDM measures.
Christchurch	16.65	90.8%	43.8	5.3%	25.00	8.35	61.9	5.2%	4.4%	Bus network restructuring, service level increases, bus priorities on main radials, new ticketing system, i/change impts, extended RTI. TDM measures.
Waikato	3.65	94.0%	18.6	11.1%	8.65	5.00	40.0	11.4%	10.0%	Bus network revisions and simplification, route extensions, service level improvements (incl regional services), extended operating hours, bus priorities, P&R development, RTI system extension.
Bay of Plenty	1.56	97.2%	9.1	46.6%	2.74	1.19	14.5	7.3%	6.0%	Bus service increases (areas served, routes, hours of operation, frequencies), bus priorities, upgraded VQS, new/upgraded transport centres, IFT, RTI.
Manawatu - Wanganui	1.06	98.1%	8.9	10.0%	1.50	0.44	12.0	4.4%	3.9%	Bus service increases (routes, hours of operation, frequencies), new service areas, bus priorities, upgraded VQS, new/upgraded bus stations, P&R, IFT.
Hawkes Bay	0.54	98.6%	4.4	2.4%	0.76	0.23	6.0	4.5%	4.1%	Enhanced bus service levels (incl operating hours and frequencies), bus stop upgrading incl seats and shelters), passenger information improvements.
Southland	0.42	98.9%	8.9	6.1%	0.48	0.05	10.2	1.5%	1.8%	Enhanced service levels, upgraded VQS (incl SLF buses), extended concession fares, improved timetable info.
Taranaki	0.35	99.2%	6.8	31.1%	0.41	0.06	7.8	2.1%	1.8%	NP bus service impts--network simplification, increased frequencies, upgraded infrastructure (bus stop facilities, terminals), improved information.
Nelson/ Tasman	0.30	99.5%	5.1		0.47	0.17	7.6	5.7%	5.0%	Expanded bus service provision (new areas, routes, frequencies, hours of operation), bus priorities, New/upgraded interchanges and infrastructure.
Otago-Wakatipu	N/A	N/A	N/A	N/A	3.22	N/A	150.0	N/A	N/A	Assumes minimal additional road capacity (SH6A etc), very high quality and level of PT services, strong parking restraint and other TDM measures.
Otago--Dunedin	2.21	95.9%	19.3	0.0%	3.22	1.01	27.4	4.8%	4.5%	Bus network restructuring, service level increases, enhanced bus VQS, new ticketing system.
Northland	0.25	99.7%	4.8	42.8%	0.31	0.06	5.6	2.6%	1.8%	Impts to Whangarei bus services, incl frequencies, coverage, VQS, pass info, bus stop facilities.
Timaru	0.19	99.9%	6.9	-3.2%	0.22	0.03	7.9	1.9%	1.8%	
Gisborne	0.12	100.0%	3.7	5.4%	0.14	0.02	4.2	1.9%	1.8%	
West Coast	0.02	100.0%	0.6	-5.6%	0.02	0.00	0.7	1.7%	1.8%	
Marlborough									1.8%	
Total All	116.35	100.0%	36.8	2.8%	174.32	54.76	49.9	4.9%	3.9%	
GPS Nat Target	116.35				145.52	29.18	42.4	2.8%	1.8%	

Notes: VQS=vehicle quality standards; IFT=integrated fares & ticketing; RTI=real time information; P&R=Park and Ride; R/S=(rail) rollingstock; SLF=super low floor; TDM=transport demand management.

Regional transport targets for sustainable transportation in New Zealand

TABLE B1.1: PT PATRONAGE TARGETS--SUMMARY BY REGION							
		POPULATION--MUA (000)					
		(Stats NZ 2007 medium forecasts for relevant MUAs)					
Region	Consultant comments on targets	00/01	06/07	07/08	15/16	00/01-07/08 CAGR	07/08-15/16 CAGR
Auckland	Outcome of Auckland Transport Strategic Alignment Project (ATSAP) process (incl funding). May be seen as optimistic rel to past trends. Substantial proportion of patronage increase associated with IFT.	1122.4	1283.4	1303.5	1470.5	2.16%	1.52%
Wellington	Adopted GW 'central' case resulting from recent GW staff work. Confirmed as reasonable target by GW staff. Target is significantly lower than RLTS (aspirational) target. GW work gave a range (approx +/- 13%) around central case--top of range is close to RLTS target. Refer separate GW File Note ('Assumptions and Sensitivities for PT Forecasting', 1 Sept 08).	387.6	415.9	419.0	442.5	1.12%	0.68%
Christchurch	Target as in ECan Metro Strategy--may be regarded as ambitious and at top end of range from recent estimates: will require continuing strong growth rates.	344.8	376.6	379.8	403.6	1.39%	0.76%
Waikato	Patronage has shown strong growth since 2000/01 (trips/ cap *2.1), and will continue to grow as result of recent initiatives. Further initiatives are planned. Initial EW advice was for "at least 18%pa growth", based on very strong growth rates of this order in recent years. In subsequent discussion, a target of about 10%pa/capita, or 11.4%pa in total, was agreed as more realistic.	171.8	193.3	195.8	216.2	1.89%	1.25%
Bay of Plenty	Patronage has been growing strongly over last few years (15-20%pa since 2003/04). No discussions held (though invitation was extended). Arguably the target is too modest, given past trends and service expansions.	152.0	168.8	171.1	189.2	1.71%	1.26%
Manawatu - Wanganui	Patronage has grown strongly for some years, but almost constant since 2005/06. In light of this, RLTS target (1.70M by 2016) looks ambitious and has been reduced here. No discussions held with RC.	116.8	119.1	119.7	124.6	0.35%	0.50%
Hawkes Bay	Patronage grown c30% since 2004/05 after previous static period. Target to increase JTW mode share from 0.5% to 2.0% by 2016 looks rather ambitious and is reduced here. No discussions held with RC.	117.1	122.2	122.8	126.8	0.68%	0.40%
Southland	Target revised downwards (170209), to reflect average national growth target per capita, as a result of discussions NZTA/SRC. (Earlier target consistent with RPTP: "Passenger levels for the FY 05/06 and onwards will exceed or equal 500,000 passengers".)	47.0	47.9	47.9	46.9	0.27%	-0.26%
Taranaki	No discussions held--adopted default (national) target for trips/capita growth.	49.2	50.9	51.1	52.1	0.54%	0.24%
Nelson/ Tasman	Current 'stretch' target to increase PT JTW to at least 10% by 2018 (c0.5% in 2006): this is v ambitious and has been reduced here. Some doubt re past/current patronage figures (NZTA records incomplete). No discussions held with RC.	55.0	58.2	58.6	61.6	0.91%	0.63%
Otago-Wakatipu	Highly optimistic target (from Wakatipu Transportation Strategy), given low base and recent slowing down of development in the area. Note that base PT numbers not available, as commercially confidential.			17.0	21.4		2.92%
Otago--Dunedin	Target approach as proposed by ORC, based on previous work (BAH) for cash flow modelling for the DUN Bus Strategy project. Wakatipu (Q'town) covered separately.	112.0	114.5	114.8	117.4	0.35%	0.28%

Appendix B

TABLE B1.1: PT PATRONAGE TARGETS--SUMMARY BY REGION							
		POPULATION--MUA (000)					
		(Stats NZ 2007 medium forecasts for relevant MUAs)					
Northland	No discussions held--adopted default (national) target for trips/capita growth. May be too modest, given past patronage increases.	47.6	50.7	51.2	54.9	1.05%	0.88%
Timaru	No discussions held--adopted default (national) target for trips/capita growth. Been struggling to grow the market for some years--maybe a strategy re-think is required.	27.3	27.5	27.5	27.6	0.10%	0.05%
Gisborne	Patronage approx constant over last 5 years.	33.0	33.6	33.7	34.1	0.30%	0.15%
West Coast	No specific targets at present. No discussions held--adopted default (national) target for trips/capita growth.	31.2	32.2	32.2	32.1	0.45%	-0.04%
Marlborough	No discussions held--adopted default (national) target for trips/capita growth. Appears to have no services at present?	27.3	29.3	29.5	30.9	1.11%	0.58%
		2841.9	3124.0	3158.2	3431.1	1.52%	1.04%

Appendix C: Assessing the impact of non-priced and priced travel demand management measures on total mode share

Methodology and assumptions

Overview

In order to allocate the three *Government policy statement* (GPS) targets on a regional basis, we identified a range of potential interventions that regional councils could implement, and then assessed how much each potential intervention could contribute towards achieving each target during the period 2008 to 2015/16. This assessment comprised several components:

- a review of existing regional land transport strategies and regional walking and cycling strategies and action plans to ascertain what measures the councils themselves thought were feasible
- workshops/meetings with regional councils
- a review of international experience with selected interventions, particularly those which provide substantiated evidence of the impact on mode share and/or kilometres travelled
- a review of New Zealand experience with selected interventions, again seeking substantiated evidence of the impact on mode share and/or kilometres travelled.

A summary of the literature review findings is found in appendix D.

Base case: underlying trends

Once we had completed the assessment of interventions, we had to establish an internally consistent starting point for policy analyses, that is, the 'base case'. The base case does not equate to either the conventional 'do minimum' or 'business as usual' situation; rather it represents a consistent set of demographic parameters (eg population, car ownership), transport supply-related parameters (eg major new infrastructure, pricing policies) and transport demand-related parameters (vehicle kilometres travelled (VKT), mode shares, freight net tonne kilometres, etc). Our base case had two main 'components' - the 'underlying trend' and the base mode share or VKT in the first year of analysis. Both of these are discussed below.

Establishing the underlying trend involved the use of 2007 Census demographic statistics; Census journey to work (JTW) statistics from 1991 through 2006; and data from the 1989/90, 1997/98 New Zealand Household Travel Survey (NZHTS) and 2004–2007 Ongoing New Zealand Household Travel Survey (ONZHTS) datasets, among other things. Some national level future year projections from the vehicle fuel emissions model (VFEM), which incorporated potential impacts of rising oil costs, were provided by the Ministry of Transport.

Table C1 Walking and cycling

Walking/cycling target – data on relevant trends and projections	
Source	Data summary
<p>Past trends</p> <p>Census journey to work (JTW) data^(a)</p>	<ul style="list-style-type: none"> From 1996–2006 (ie effectively covering one more year than the two NZHTS surveys), the proportion of walk/jog/cycle trips as a share of all JTW trips – for persons aged 15 years or over – reduced by 15.3%, from 10.1% to 8.6%. The decline in the share of walk/jog/cycle trip legs between the 1997/98 NZHTS and the 2004–07 ONZHTS is 14.2% (from 20.5% to 17.6%). This suggests that trends in walk/jog/cycle trips for JTW were a plausible proxy for trends for <i>all</i> walking trips. From 1991–1996, the proportion of walk/jog/cycle trips as a share of all JTW trips reduced from 12.2% to 10.1%, a relative decrease of 17.2%. From 1996–2001, the proportion of walk/jog/cycle trips as a share of all JTW trips reduced further, albeit at a slower rate, from 10.1% to 9.1%, a relative decrease of 10.9%. From 2001–2006, these trends showed a further slowing down: from 9.1% to 8.6%, a relative decrease of 5.5%. There was reasonable variation in the trends for walking and cycling (W/C) mode share for JTW by region, (which could reflect local weather conditions on Census day), hence the national trend is considered more representative.
NZ Household Travel Survey ^(b)	<ul style="list-style-type: none"> 1997/98 NZHTS and 2004–07 ONZHTS were <ul style="list-style-type: none"> – millions of W/C trips per year: 1997/9 = 1259.1 (20.5% mode share), 2004–07 = 1162.2 (17.6% mode share), a relative decline in W/C mode share of 14.2% – trips per capita per year: 1997/98 = 333.0, 2004–07 = 282.8, a relative decline of 15.1%
Other walking and cycling data	<ul style="list-style-type: none"> Auckland cycle counts: integrated and standardised regional cycle monitoring commenced for the first time in March 2007. This monitoring occurred at 69 sites across the region. A total of 4358 cyclist movements were recorded across the 69 sites in the morning peak period (between 6.30am and 9.00am). A total of 4390 cyclist movements were recorded across the 69 previously monitored sites in the morning peak period (between 6.30am and 9.00am) in 2008. This has been stable since 2007 (4358 movements). Comparison of the 2007 survey with 2006 data from Auckland city sites where the same cycle count methodology was used in previous years shows a 7% increase in cyclists. Note that cyclist <i>movements</i> are not the same as cyclist <i>numbers</i>. Wellington cordon cycle and pedestrian counts (2000–2007, March each year): count pedestrians and cyclists in- and out-bound to/from central city in morning peak; pedestrians along golden mile and across the waterfront at midday; and cyclists at suburban locations in the morning peak period. While there has been a lot of fluctuation), cyclists ‘commuting’ show a definite upward trend, more than doubling since 2000; pedestrians crossing the cordon has held steady or perhaps increased slightly overall. other pedestrian counts are available for specific street blocks (eg for real estate purposes) Tauranga City Council website: one of the measures determining the vibrancy of the city centre is a count of pedestrians at key points. In Tauranga city centre the pedestrian count for 2006 was 15,880 and increased to 16,316 in 2007 – an overall increase of 3.5%. Hamilton cycle counts – annual cordon counts at various sites on one day per year (since 1980): in May 2008, counts were >10% higher than 2007 – first rise since counts peaked in 1997.
Future projections	None known

Notes/sources:

^(a)Census journey to work data, national level, years 1991, 1996, 2001 and 2006. All figures quoted **exclude** people not working, and not stated. People working at home and the category ‘other’ (taxi, ferry, plane, etc) are included.

^(b)Analyses conducted by C. O’Fallon, using Census journey to work and ONZHTS data (refer appendix D).

Walking/cycling underlying trends – summary and conclusions

- The evidence indicates that walking and cycling trips, as a share of all trips (whether JTW or for any purpose), were declining at an ever-decreasing rate through the 1990s to 2006. If the trend shown in the JTW was to continue, it suggests that between 2006 and 2011, the walking and cycling mode share would stabilise to about its current levels, or possibly slightly lower.
- Recent cycle counts in Auckland, Wellington and Hamilton suggest that cycling movements are increasing. Wellington pedestrian counts suggest stability in pedestrian movements.
- The weight of evidence appears to indicate an underlying mode share and per capita trend of close to zero change overall, with the risk of a possible decline of up to 1% per year maximum (1% being the annual rate of decline recorded in the JTW between 2001 and 2006).
- No forecasts of walking and cycling mode share are available.
- It would seem reasonable to assume a virtually unchanged level of mode share and trip legs/capita for the period up to 2015/16.
- Our judgement, for target assessment purposes, is that the underlying trend in walking and cycling trip legs mode share and in trip legs/capita up to 2015/16 would be in the range between **zero change** and a **5% (ie approx 0.5% pa) decline**.

Table C2 Single occupancy vehicle kilometres travelled

Single occupancy vehicle kilometres travelled target – data on relevant trends and projections	
Source	Data summary
Past trends National light VKT trends (VFEM) ^(a)	<ul style="list-style-type: none"> • Light VKT/capita increased rapidly through 1990s (17.8% or 2.4% pa 1992-1999), then more slowly up to 2005 (6.0% or 1.0% pa 1999-2005). In 2006 and 2007, it declined from the 2005 high.
Census journey to work data ^(b)	<ul style="list-style-type: none"> • From 1991-1996, the car person trips: car driver trips ratio (a measure of occupancy) reduced from 1.12 to 1.095. • From 1996-2001, the occupancy measure reduced from 1.095 to 1.077. The car driver share increased significantly (65.6% to 67.8%) while the car person share reduced substantially (6.2% to 5.2%). • From 2001-2006, these trends largely stabilised: the occupancy measure increased marginally (1.077 to 1.078); the car driver share increased slightly (67.8% to 69.4%) and the car person share increased marginally (5.2% to 5.4%). • Each of the three main regions showed very similar trends 1996-2001-2006 to the national trends.
NZ Household Travel Survey ^(c)	<ul style="list-style-type: none"> • Average vehicle occupancies (using the car person trips: car driver trips ratio), for MUA light vehicle travel, weekdays (excl employer business) from 1997/98 and 2004-07 HTS were: <ul style="list-style-type: none"> - all trips 1997/98 = 1.52, 2004-07 = 1.45 - work trips 1997/98 = 1.14, 2004-07 = 1.09 Almost all individual main urban areas showed similar trends to these national figures.
Other occupancy data	<ul style="list-style-type: none"> • Wellington CBD cordon, am peak, inbound, years 1999-2007: average car occupancy appears to have not changed significantly (average 1.368, range 1.326 to 1.412). • Auckland region screenline surveys, 2001 and 2006: mixed picture with no clear patterns, but suggesting marginal decline overall (occupancy decreased at about two-thirds of sites, increased at one-third). • Christchurch (Environment Canterbury) surveys, am peak inbound, cars and vans: indicate increase 1.25 in 1991, 1.29 in 2003 and 1.34 in 2007. Not clear on reliability of results.

Single occupancy vehicle kilometres travelled target – data on relevant trends and projections	
Source	Data summary
Future projections National light VKT forecasts (VFEM) ^(a)	<ul style="list-style-type: none"> VFEM medium forecasts for light VKT pa/capita give 8725km for 2007 decreasing gradually to 8254km in 2011, then increasing to 8408km in 2015 and 8462km in 2016. Hence the average 2012–16 figure is 4.7% below the average 2003–07 level. This medium forecast assumes a future oil price of US\$100/barrel (2006 prices) and a NZ/US exchange rate of \$0.60. VFEM range on this forecast result (2003–07 to 2012–16) is between -2.1% (US\$80/barrel) to -8.3% (US\$120/barrel)

Notes/sources:

^(a) MoT VFEM, 2007 update version), spreadsheet ex Stuart Badger, MoT, 23 Oct 2008.

^(b) Census journey to work data, national level, years 1996, 2001 and 2006. All figures quoted **exclude** people not working, and not stated. People working at home and the category 'other' (taxi, ferry, plane, etc) are included.

^(c) PR&P Ltd analyses; NZHTS 1997/98 and ONZHTS 2004–07 data.

SOV KT underlying trends – summary and conclusions***Light vehicle occupancy***

- The evidence indicates that average vehicle occupancy was declining quite substantially through the 1990s, but has more or less stabilised since then. The weight of evidence since 2001 appears to indicate close to zero change overall, but most likely a very slight overall decline.
- No forecasts of vehicle occupancy are available. It would seem reasonable to assume a virtually unchanged average occupancy level for the period up to 2015/16.

Total light VKT/capita

- Light VKT/capita increase at around 2.5%pa through the 1990s, then at around 1.0% pa up to 2005, with some decline in 2006 and 2007.
- MoT (VFEM) forecasts indicate that the 2012–16 average light VKT/capita would be about 5% (range 2% to 8%) **below** the 2003–07 average level, ie a most likely decline of around 0.5%pa. These forecasts assume oil prices in the range of US\$80–\$120/barrel and a US/NZ exchange rate of \$0.60.

SOV KT/capita

- Given the above appraisal of vehicle occupancy, these VFEM forecasts suggest an underlying decline of around 5% in SOV KT/capita in the period up to 2016.
- However, it could be considered that the VFEM assumptions on petrol prices are on the pessimistic (high) side (even at US\$80/barrel). Thus a 'no change' underlying outcome for SOV KT/capita would not be unreasonable.
- Our judgement, for target assessment purposes, is that the underlying trend in SOV KT/capita up to 2015/16 would be in the range between **zero change and a 5% decline**.

Base case: base mode share and/or vehicle kilometres travelled

Having established the range of potential mode shift and/or VKT impacts of the initiatives, we modelled their likely outcome if applied in the main urban areas (MUAs) (by region) in New Zealand as a whole (SOV KT) or by region (walking/cycling and public transport (PT)).

The base mode share and trip length data is taken from the ONZHTS 2004–07.¹ Within the ongoing or continuous survey, people in over 2200 households in 280 meshblocks throughout New Zealand are invited to participate each year. Every member normally resident in a household is then visited and interviewed about all of their travel for two consecutive days specified by the interviewer. Day 1 begins at 4am and Day 2 ends at 3.59am. A ‘complete’ dataset representing all of New Zealand is compiled every four years.²

While not always having a sufficient sample size to be statistically confident of the result, it is possible to analyse a variety of geographical subgroups within the ONZHTS data including: regions, territorial authorities, main urban areas, and cities or towns. Where the sample size was insufficient, we ‘clustered’ MUA locations for the analysis we did to calculate the impacts, at the national level, of the initiatives we considered. In effect we created eight MUA regions:

- 1 Auckland (all western, northern, central, southern, plus Papakura)
- 2 Hamilton zone (including Cambridge and Te Awamutu zones)
- 3 North of North Island MUAs (Whangarei, Tauranga, Rotorua)
- 4 South of North Island MUAs (Gisborne, Napier-Hastings, New Plymouth, Wanganui, Palmerston North)
- 5 Wellington (four cities plus Kapiti zone)
- 6 Christchurch
- 7 Dunedin
- 8 Rest of SI MUAs (Nelson, Invercargill)

In this way we could generate statistically meaningful results for driver VKT, walking/cycling trips, etc. Where necessary, we apportioned these results to individual regions (eg Northland and Waikato) on a regional MUA population basis.

The reported effect of any given initiative is the percentage (%) change on the base for the MUA portion(s) of the region, assuming that this is ‘business as usual’. The percentage change is not cumulative – it is the total change that we estimate would occur after the initiative is implemented and it could be applied to any year, provided the described conditions have been met. In our calculations of VKT removed, we have excluded trucks, vans, taxis and motorcycles (the first three because of their commercial use and the latter due to their small numbers in the database), leaving private passenger vehicles only in the analysis.

¹ We have labelled the dataset collected between 1 July 2003 and 30 June 2007 as the ‘2004–07 dataset’, referring to the *end* of the data collection year (which matches the New Zealand Government’s financial year, 1 July – 30 June).

² Further detailed information about the ongoing survey can be obtained from the Ministry of Transport website www.transport.govt.nz/research/TravelSurvey/ Information about the 1997/98 NZHTS can be found at www.transport.govt.nz/research/aboutthe199798HouseholdTravelSurvey/

TDM initiatives examined

The following sections briefly describe the inputs and assumptions for each of the measures we modelled.

School travel plans

The Ministry of Education regularly publishes school roll information on its website. The Auckland Regional Transport Authority evaluated the impact of school travel plans for the 2007 school year, and we used these results to determine what the impact on VKT, walking and cycling, PT and driver trips would be in 2015/16, assuming all New Zealand primary and secondary schools had actively implemented travel plans. The effects were calculated based on a 192-day school year, with each child in the school population making two trips per day. We assumed that all drivers who would have driven a child to school and then gone straight home again (approximately 30% of all people driving children to school in Auckland/Wellington/Christchurch in the 1997/98 NZHTS³) would no longer drive as a result of the travel plan. We also assumed that half of the driver trips averaged 5km per trip (the mean distance from home to school for secondary students) and the other half averaged 1km per trip (the mean distance from home to school for primary students).

The overall impact is so small in terms of total VKT, walking/cycling trips, driver trips, etc that we adopted the same values for each region as we determined for the national level impact.

Workplace-based initiatives: workplace travel plans, teleworking and guaranteed ride home

Our workplace travel plan (WPTP) analysis used the mode share elasticities established in 2004 in the NZTA's *Economic evaluation manual*, volume 2, as our review of later evaluations confirmed their validity. 'Business demography tables' for 2007 were obtained from the Statistics NZ website.

We assumed that by 2015/16:

- high quality WPTPs would be actively implemented in 50% of businesses with 20+ employees in the Auckland, Waikato, Manawatu-Wanganui, Wellington, Bay of Plenty, Canterbury and Otago regions
- WPTPs would be implemented in 50% of businesses with >50 employees in the Nelson region.

We also expected that the organisations would have some type of parking and/or congestion issues present and that some public transport services would be readily available.

Teleworking was modelled as predominantly occurring in the three main MUAs (Auckland, Wellington and Christchurch), with a lesser amount occurring in other regions which had one or more MUAs (Northland, Waikato, Manawatu-Wanganui, Bay of Plenty, Hawke's Bay, Taranaki, Gisborne, Nelson, Otago and Southland). The assumption was that the amount of teleworking would lie somewhere between approximately 20% of all employees teleworking one day per month and all employees teleworking one day per month (or 25% of employees teleworking one day per week).

Guaranteed ride home (GRH) programmes were modelled as providing a shift of 1.4% in SOV KT (0.5% in walking and cycling) in the largest MUA regions (Auckland, Wellington, Canterbury, Waikato, Bay of Plenty, Manawatu-Wanganui and Otago) and 0.5% shift in SOV KT for the smaller MUA regions.

³ See O'Fallon and Sullivan (2005) for further details.

For both the WPTP and teleworking, we selected trip legs from the ONZHTS with the purpose 'main job' or 'other job' on weekdays, specifically excluding those that were 'employer's business'. We doubled these to include the trip 'home' at the end of the day. We also took the mean journey to work trip length from the ONZHTS. With respect to teleworking, we have not calculated any change in PT or walking/cycling mode share. There are two reasons for this:

- We have no evidence from our international and NZ review as to the effect of teleworking on these modes.
- We suspect that any effect will be very marginal: there will be some people who no longer walk, cycle or use public transport to get to work when they telework, thus decreasing the use of these modes. Equally, there will be people who specifically use these modes while teleworking to go to meetings, get exercise, etc.

We also have made an educated guess as to the effect of GRH on mode share, due again to the absence of hard evidence regarding its impact.

We recognise there may be some double counting of impacts as a result of separately documenting workplace travel plans, teleworking and GRH, although we think this will be fairly minimal because:

- neither GRH nor teleworking have so far been 'common' features of travel plans in New Zealand
- GRH and teleworking do not have to occur in the context of a workplace travel plan. Hence they can be implemented by any business of any size and by businesses that are otherwise unwilling or unable to implement travel plans.

Cordon toll

We adopted the same base assumptions for the cordon toll analysis as was used in the 2006 Auckland Road Pricing Evaluation Study (ARPES). Operating from 6am to 10am on weekdays, the cordon toll was estimated as reducing vehicle traffic by 5% to 6%; increasing PT from 7% to 12% or 9%; increasing walking and cycling from 15% to 17%.

We first calculated the effect of the cordon toll on the journey to work (main or other job) trips, doubling the numbers to include the return trip home, for journeys between 6am and 10am. We determined the mean VKT for these trips and the mode shift to PT and walking/cycling for the journey to and from work. We then considered the impact of the VKT and mode shift for the return work journey on the total number of driver, PT and walking/cycling trips and total annual VKT.

Parking levy

The parking levy mechanism was based on the ARPES \$5 parking charge, which was applied in congested areas and major destinations during the morning peak period and was intended to cover all car parks within a reasonable walking distance of key employment locations.

The parking levy was assumed to impact on all employees in a region for two trips per day, five days per week and 46 weeks per year (taking into account vacations and public holidays). The analysis of impact was limited to journey to work (and return) trips and VKT due to the timing of the levy.

Trips were diverted to PT and walking/cycling at different rates depending on the size of the MUA region and how well developed the PT network was –2.3% to PT, and 0.5% to walking in larger MUA regions and 0.8% to PT and 1.5% to walking/cycling in others.

Personalised travel planning

For this analysis, we used the mode share elasticities established in 2004 in the NZTA's *Economic evaluation manual*, volume 2, as our review of later evaluations confirmed their validity. We also assumed that larger regions (Auckland, Waikato, BOP, Wellington, Canterbury, Otago) would implement a 'standard' personalised travel plan initiative, while smaller/secondary regions would implement a 'low-level' one.

We assumed that by 2015, 25% of the MUA populations could have been invited to participate in a personalised travel planning initiative in larger MUA regions, while 25% would have been involved in smaller MUA regions. We have also assumed that there would be ongoing 'maintenance' of any such programmes implemented, to encourage/ensure mode shift gains continued in the medium to long term.

The total trips by each MUA region were included in the analysis.

Intensification

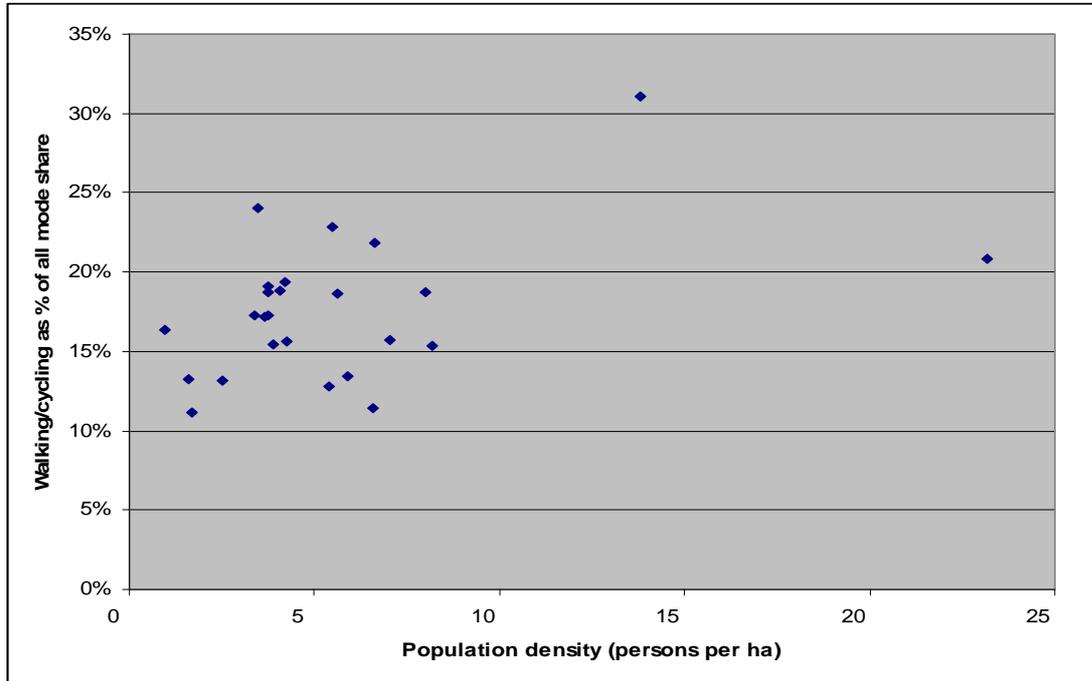
We took a three-pronged approach to considering how New Zealand's projected population growth might affect modal split:

- No change to modal split – all population growth is spread throughout the region, particularly in brownfield and greenfield developments, so that density remains quite low and mode use is unchanged.
- Most of the population growth occurs in reasonably well-defined central city areas in the largest MUAs (within Auckland, Wellington and Canterbury regions), with quite significant impacts on modal use.⁴
- Somewhere in between: some intensification or densification does occur, along with some modal shift.

Initially we examined NZ data on population density compared with driver and walking/cycling mode share to determine if there were any detectable trends. As can be demonstrated using the scatter plot for walking/cycling (figure C1), this was not possible.

⁴ We examined other centres with a view to including intensification effects, but found that it was unlikely there would be sufficient density by 2015/16 to make a significant difference to mode share

Figure C1 Scatter plot of NZ 'main urban area' population densities paired with walking/cycling as a proportion of all modes

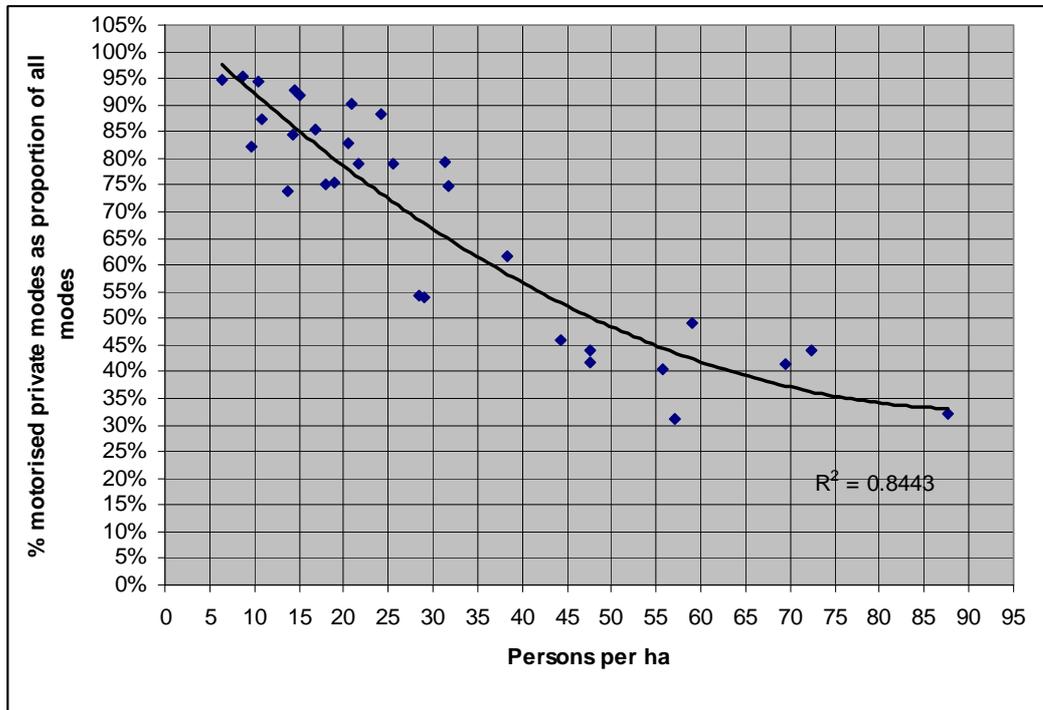


Source: Statistics NZ (2007) and ONZHTS 2004-07 dataset

Subsequently, we used data from Jeffrey Kenworthy and Peter Newman (2001) *Melbourne in an international comparison of urban transport systems* as part of the Melbourne strategy to estimate the effect of increasing population densities on modal split. As can be seen by the R² co-efficient,⁵ we were able to establish a reasonably good fit for the relationship between driver trips, PT trips, and walking/cycling trips and population density (refer figures C2, C3 and C4).

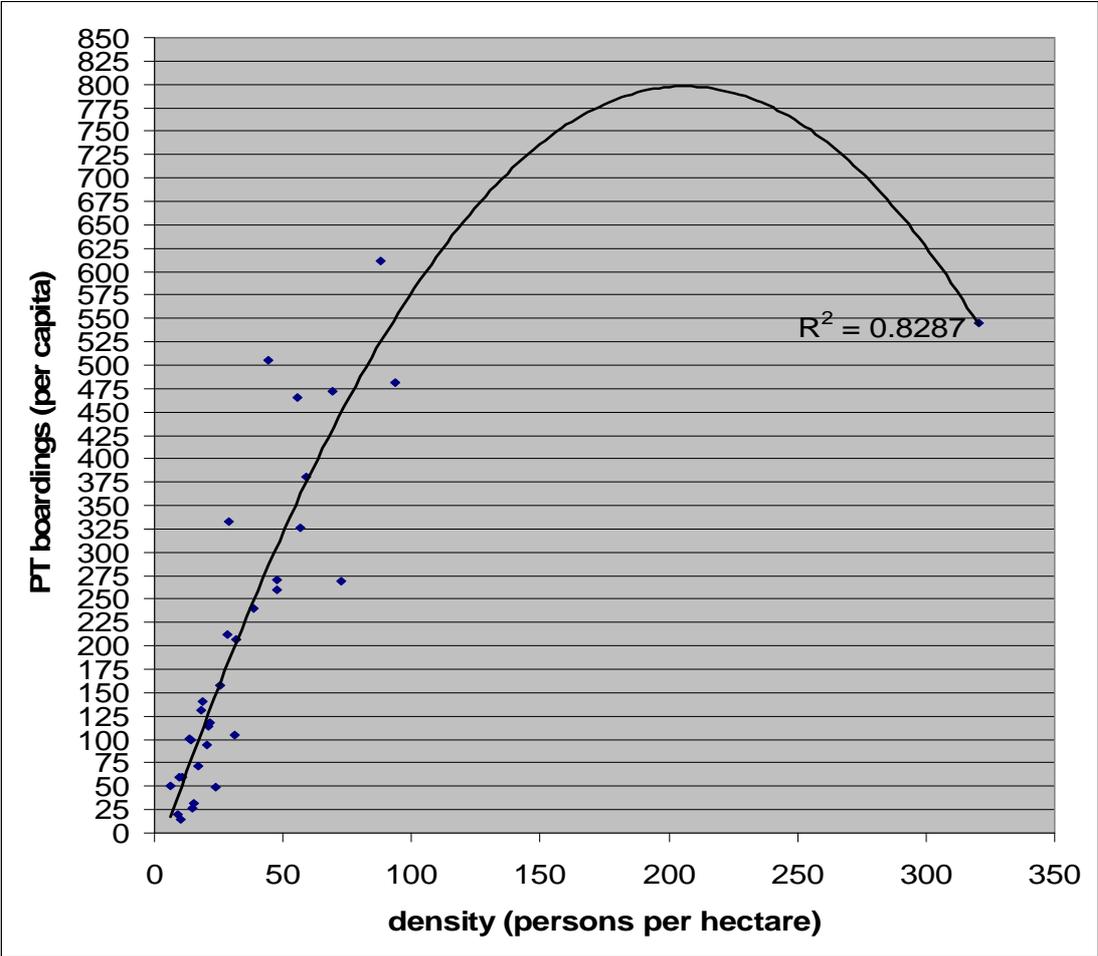
⁵ The R² co-efficient quantifies goodness-of-fit, where higher values (in a range of 0.0 and 1.0) indicate that the model fits the data better.

Figure C2 Regression analysis of population density and percentage motorised private modes as a proportion of all modes - comparison of 31 international cities



Source: Kenworthy and Newman (2001)

Figure C3 Regression analysis of population density and public transport passenger boardings per capita - comparison of 31 international cities

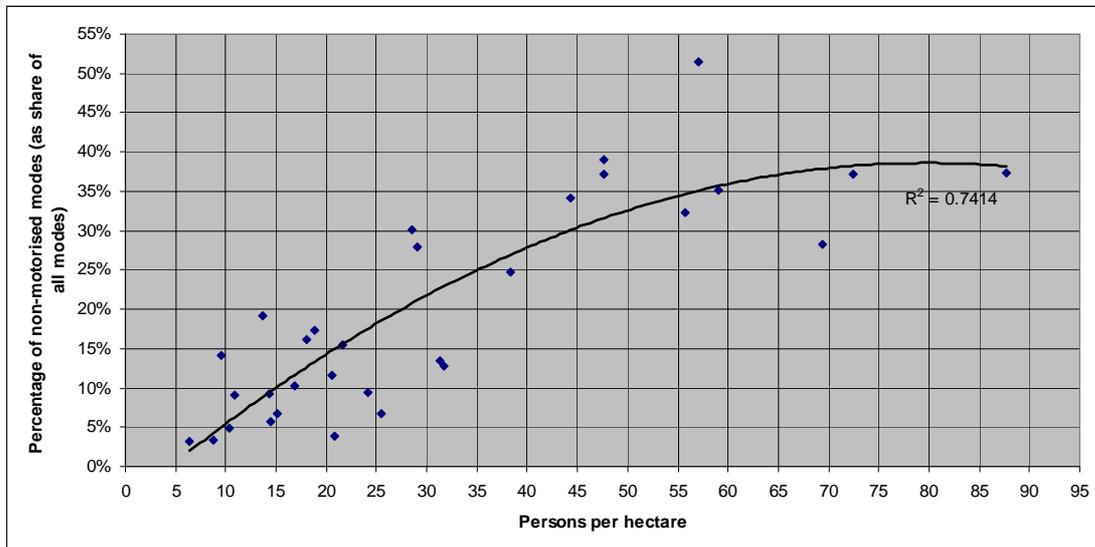


Source: Kenworthy and Newman (2001)

The analysis suggests, that at lower densities (less than 40 persons per hectare), a five person per hectare increase in density will result in a 6% decrease in private passenger vehicle trips (which may be either as driver or passenger) and a 4% increase in walking/cycling trips, both as a proportion of all trips. PT boardings increase significantly, from approximately 50 boardings per capita where there is a population density of 10 people per hectare to 275 boardings per capita at a population density of 50 people per hectare.⁶

⁶ Note that the impact on absolute mode share would be relatively minor, given the low baseline for PT, generally less than 2% of all modes used outside of three largest urban regions, where it is between 4% and 6%.

Figure C4 Regression analysis of population density and percentage non-motorised modes as a proportion of all modes - comparison of 31 international cities



Source: Kenworthy and Newman (2001)

Note, however, that this analysis excludes any consideration of other factors that might influence travel behaviour/patterns. Based on evidence from 370 American urbanised areas, Cervero and Murakami (2008) established a direct elasticity of -0.6 for high population density and vehicle miles travelled per capita. They also observed that this high direct elasticity was offset by travel-inducing effects of denser roadway infrastructure and higher access to shopping and personal services found in denser urban settings, and calculated a net elasticity of -0.381.

We have adjusted the simple estimate taken from Kenworthy and Newman's work to take into account these 'hidden factors'. We reduced the suggested impact of 6% per five person/hectare increase in density by the same proportion as determined by Cervero and Murakami (2008), and used 3.8% for calculating the effects of densification on mode share.

Cervero and Murakami (2008) did not specifically assess the effect of density on walking and cycling (active transport) or public transport mode shares but made several observations about the relationship between 'walkability' and other 'built environment' factors all of which might temper the relationship between density and walking/cycling or PT mode shares (as evidenced by the fairly wide scatter of points in figure C3 and figure C4). In the absence of any specific evidence, we have used a slightly modified 3% increase in walking/cycling mode share per five person/hectare increase in density. This potentially takes into account the fact that some of the mode shift from driver would be to PT.

In areas outside those that 'intensify', it could be assumed that the mode share would remain consistent with 2004-07 mode split.

References

- Cervero, R and J Murakami (2008) *Shrinking urban transportation's environmental footprint evidence on built environments and travel from 370 U.S. urbanized areas*. Paper Prepared for Institute of Urban and Regional Development, University of California, Berkeley and National Science Foundation.
- Kenworthy, J and P Newman (2001) *Melbourne in an international comparison of urban transport systems*. A report to the Department of Infrastructure, Melbourne as part of the Melbourne Strategy. Institute for Sustainability and Technology Policy, Perth, 62pp.
- Ministry of Transport (2006) Auckland road pricing evaluation study. Accessed from www.transport.govt.nz
- O'Fallon, C and C Sullivan (2005) Trip chaining: understanding how New Zealanders link their travel. *Transfund NZ research report 268*. Available from www.itsa.govt.nz/research/reports/index.html
- Statistics NZ (2007) Living density. Available from www.stats.govt.nz/analytical-reports/housing/housing-statistics/living-density-table-1.htm

Appendix D: Development of walking/cycling and single occupancy vehicle – kilometres travelled (SOV KT) targets

Table	Content
D1 Walking/cycling targets – summary by region	For each region, the table shows the walking/cycling regionalised target (in millions of walking/cycling (w/c) trip legs), as well as providing two scenarios:
	1 the projected millions of w/c trip legs in 2015/16 assuming the <i>underlying trend</i> is towards zero growth/decline in the number of walking/cycling trips per capita per year (pre-intervention), and that each region undertakes the interventions modelled (as listed in the table)
	2 the projected millions of w/c trip legs in 2015/16 assuming the <i>underlying trend</i> is towards a 5% decline in the number of walking/cycling trips per capita in total between 2006/07 and 2015/16 (pre-intervention), and that each region undertakes the interventions modelled (as listed in the table).
D2 SOV KT targets – summary by region	For each region, the table shows the SOV KT regionalised target (in annual km per resident per year), as well as providing two scenarios:
	1 The projected annual SOV KT per resident in 2015/16 assuming the <i>underlying trend</i> is towards zero growth/decline in the SOV KT per capita per year (pre-intervention), and that each region undertakes the non-priced and priced interventions modelled (as listed in the table);
	2 The projected annual SOV KT per resident in 2015/16 assuming the <i>underlying trend</i> is towards a 5% decline in the SOV KT per capita in total between 2006/07 and 2015/16 (pre-intervention), and that each region undertakes the interventions modelled (as listed in the table).
D3 Region-MUA allocation	For each region, the projected impacts of the travel demand management measures modelled for this research project on (1) SOV KT and (2) walking/cycling mode share are given. The total (possible) projected impacts are summarised, and the ‘assigned impact’ used in this analysis is given. Generally the assigned impact is much lower than the (possible) projected impact, recognising that regions may not be in a position to fully implement all of the initiatives in the timeframe available.
D4 Summary – modelled scenarios and their impacts	This table describes the scenarios we used to model the potential impact of various transport demand management (TDM) measures in New Zealand.
D5 Summary – literature review/mode share allocation	This table summarises the impacts for the TDM measures modelled in this research project as found in key documents/reports reviewed as part of the literature review.
D6 Literature review	This table summarises key points from the literature reviewed (eg description of how the intervention was implemented; the review was structured; the monitoring method; and reported impacts)

Regional transport targets for sustainable transportation in New Zealand

TABLE D1: WALKING/CYCLING TARGETS--SUMMARY BY REGION														
Region	2004/07				TARGET W/C	2015/16					2015/16		Key Non-Pricing Measures included	Pricing Measures (parking levy/tolls)
	Baseline					SCENARIO 1 - Assume underlying trend: zero-change in walk trips / capita / year (pre-interventions)					SCENARIO 2 - Assume underlying trend: 5% decline in walk trips per person in total by 2015/16; measures have same impact as Scenario 1			
	Population	Million trips travelled by residents	% of national total	Trips per resident per year	9.4% increase in w/c trips by 2015/16 (1% per year)	Projected population growth rate to 2015/16	Projected M trips by 2015/16 - pre-intervention (incl pop growth)	Impact of non-priced TDM measures*	Projected trips per resident	Projected M trips by 2015/16 - post-intervention (incl pop growth)	Projected M trips by 2015/16 - pre-intervention (incl pop growth)	Projected M trips by 2015/16 - post-intervention (incl pop growth)		
Northland	146035	40.0	3.4%	273.9	43.72	1.045	41.80	2%	279.4	42.64	39.71	40.50	Personalised travel planning; STP; pedestrian/cycle networks	
Auckland	1338036	375.0	32.2%	280.3	409.88	1.126	422.25	5%	294.3	443.36	401.14	421.19	WPTP; Personalised travel planning; Guaranteed ride home; STP; pedestrian/cycle network; Intensification	Yes
Waikato	387131	76.0	6.5%	196.3	83.07	1.054	80.10	2%	200.2	81.71	76.10	77.62	WPTP; Personalised travel planning; Guaranteed ride home; STP; pedestrian/cycle network	Yes
Bay of Plenty	238313	44.00	3.8%	184.6	48.09	1.072	47.17	2%	188.3	48.11	44.81	45.71	WPTP; Personalised travel planning; Guaranteed ride home; STP; pedestrian/cycle network; Intensification	Yes
Gisborne/Hawkes Bay	195521	43.00	3.7%	219.9	47.00	1.018	43.77	2%	224.3	44.65	41.59	42.42	Personalised travel planning; Guaranteed ride home; STP; pedestrian/cycle network	
Taranaki	113257	24.0	2.1%	211.9	26.23	0.991	23.78	2%	216.1	24.26	22.59	23.05	Personalised travel planning; STP; pedestrian/cycle networks	
Manawatu-Wanganui	225488	48.0	4.1%	212.9	52.46	1.009	48.43	2%	217.1	49.40	46.01	46.93	WPTP; Personalised travel planning; Guaranteed ride home; STP; pedestrian/cycle network	Yes
Wellington	461466	183.0	15.7%	396.6	200.02	1.045	191.24	4%	412.4	198.88	181.67	188.94	WPTP; Personalised travel planning; Guaranteed ride home; STP; cycle network; Intensification	Yes

Appendix D

TABLE D1: WALKING/CYCLING TARGETS--SUMMARY BY REGION															
Region	2004/07				2015/16							2015/16		Key Non-Pricing Measures included	Pricing Measures (parking levy/tolls)
	Baseline				TARGET W/C	SCENARIO 1 - Assume underlying trend: zero-change in walk trips / capita / year (pre-interventions)				SCENARIO 2 - Assume underlying trend: 5% decline in walk trips per person in total by 2015/16; measures have same impact as Scenario 1					
	Population	Million trips travelled by residents	% of national total	Trips per resident per year	9.4% increase in w/c trips by 2015/16 (1% per year)	Projected population growth rate to 2015/16	Projected M trips by 2015/16 - pre-intervention (incl pop growth)	Impact of non-priced TDM measures*	Projected trips per resident	Projected M trips by 2015/16 - post-intervention (incl pop growth)	Projected M trips by 2015/16 - pre-intervention (incl pop growth)	Projected M trips by 2015/16 - post-intervention (incl pop growth)			
Nelson - Tasman - Marlborough	138691	45.0	3.9%	324.5	49.19	1.045	47.03	2%	331.0	47.97	44.67	45.57	Personalised travel planning; Guaranteed ride home; STP; pedestrian/cycle network	Yes	
Canterbury	528204	186.0	16.0%	352.1	203.30	1.063	197.72	2%	359.2	201.67	187.83	191.59	WPTP; Personalised travel planning; Guaranteed ride home; STP; pedestrian/cycle network; Intensification	Yes	
West Coast	33989	11.0	0.9%	323.6	12.02	0.973	10.70	4%	336.6	11.13	10.17	10.57	STP; cycling/pedestrian network; personalised travel planning		
Otago	197214	67.0	5.8%	339.7	73.23	1.036	69.41	2%	346.5	70.80	65.94	67.26	WPTP; Personalised travel planning; Guaranteed ride home; STP; pedestrian/cycle network	Yes	
Southland	108974	21.0	1.8%	192.7	22.95	0.964	20.24	2%	196.6	20.65	19.23	19.62	Personalised travel planning; Guaranteed ride home; STP; pedestrian/cycle network		
Total	4112319	1163.0	100%		1271.16	1.072	1243.65			1285.23	1181.47	1220.97			

* the impact of priced TDM measures on walking and cycling, by 2015/16 is assumed to be fairly marginal (when considered in the context of non-priced measures) and will only occur in specific regions (namely Auckland, Wellington, Canterbury, Waikato, Bay of Plenty, Manawatu-Wanganui, Otago, and Nelson). Refer to 'Region-MUA allocation' worksheet for more detail regarding non-priced and priced TDM measures included in the analysis.

Regional transport targets for sustainable transportation in New Zealand

TABLE D2: SOV KT TARGETS--SUMMARY BY REGION												
Region	MUAs	2004/07			2015/16				2015/16		Key Non-Pricing Measures included	Pricing Measures (parking levy/tolls)
		Baseline			TARGET SOV KT*	SCENARIO 1 - Assume underlying trend: zero-change in SOV KT / capita / year (pre-interventions)			SCENARIO 2 - Assume underlying trend: 5% decline in SOV KT per person in total by 2015/16; measures have same impact as Scenario 1			
<i>Total</i>												
		Million km travelled by residents	% of national total	Km per resident per year	10% reduction in annual km per resident	Impact of non-priced TDM measures	Impact of priced TDM measures	Projected Km per resident	SOV KT in 2015/16 (pre-intervention)	SOV KT in 2015/16 (post-intervention)		
Northland	Whangarei	111.59	1%	2457	2211.02	2.0%	n/a	2407.56	2333.86	2287.18	Teleworking; Personalised travel planning; STP; pedestrian/cycling network	
Auckland	North Shore Waitakere Auckland Manukau	4147.97	47%	3310	2978.59	7.0%	2.0%	3011.68	3144.06	2861.10	Workplace travel planning; Teleworking; Personalised travel planning; Guaranteed ride home; STP; pedestrian/cycle network; HOV strategy; Intensification	Yes
Waikato	Hamilton	616.01	7%	3563	3206.78	5.0%	2.0%	3313.67	3384.94	3147.99	Workplace travel planning; Teleworking; Personalised travel planning; Guaranteed ride home; STP; pedestrian/cycle network	Yes
Bay of Plenty	Tauranga Rotorua	334.77	4%	2457	2211.02	5.0%	2.0%	2284.73	2333.86	2170.49	Workplace travel planning; Teleworking; Personalised travel planning; Guaranteed ride home; STP; pedestrian/cycle network; intensification	Yes
Gisborne	Gisborne	72.95	1%	2363	2126.47	2.0%	n/a	2315.49	2244.61	2199.72	Teleworking; Personalised travel planning; STP; pedestrian/cycle network	
Hawkes Bay	Napier-Hastings	277.20	3%	2363	2126.47	2.0%	n/a	2315.49	2244.61	2199.72	Teleworking; Personalised travel planning; Guaranteed Ride Home; STP; pedestrian/cycle network	
Taranaki	New Plymouth	269.91	3%	2363	2126.47	2.0%	n/a	2315.49	2244.61	2199.72	Teleworking; Personalised travel planning; STP; pedestrian/cycle network	
Manawatu - Wanganui	Wanganui Palmerston North	109.42	1%	2363	2126.47	4.0%	n/a	2268.23	2244.61	2154.82	Workplace travel planning; parking levy; Teleworking; Personalised travel planning; Guaranteed ride home;	Yes
Wellington	Kapiti Wellington Upper Hutt Lower Hutt Porirua	1407.98	16%	3459	3113.28	6.0%	2.0%	3182.46	3286.24	3023.34	Workplace travel planning; Teleworking; Personalised travel planning; Guaranteed ride home; STP; pedestrian/cycle network; Intensification	Yes

Appendix D

TABLE D2: SOV KT TARGETS--SUMMARY BY REGION													
		2004/07			2015/16				2015/16				
Tasman	<i>NO MUA</i>												
Nelson	Nelson	165.63	2%	2820	2537.58	4.0%	n/a	2706.75	2678.56	2571.42	Workplace travel planning; Teleworking; Personalised travel planning; Guaranteed ride home; STP; pedestrian/cycle network		
Marlborough	<i>NO MUA</i>												
Canterbury	Christchurch	838.09	10%	2386	2147.71	5.0%	2.0%	2219.30	2267.03	2153.67	Workplace travel planning; Teleworking; Personalised travel planning; Guaranteed ride home; STP; pedestrian/cycle network; Intensification		Yes
West Coast	<i>NO MUA</i>												
Otago	Dunedin	317.09	4%	2737.65	2463.89	4.0%	n/a	2628.15	2600.77	2496.74	Workplace travel planning; Teleworking; Personalised travel planning; Guaranteed ride home; STP; pedestrian/cycle network		Yes
Southland	Invercargill	135.51	2%	2819.54	2537.58	2.0%	n/a	2763.15	2678.56	2624.99	Teleworking; Personalised travel planning; Guaranteed Ride Home; STP; pedestrian/cycle network		
Total		8804.12	100%	3038.5	2734.66								

Regional transport targets for sustainable transportation in New Zealand

TABLE D3: TDM MEASURES IMPACT AS ALLOCATED TO MUA-REGIONS (SOV KT) AND REGION (W/C)																		
Measure	Range of % of SOV KT reduction (relative to 2004/07 base)	Range of PT trip increase (relative to 2004/07 base)	Range of walking/cycling trip increase (relative to 2004/07 base)	Auckland		Wellington		Canterbury		Waikato		Bay of Plenty		Manawatu-Wanganui		Otago		
				SOV KT	W/C	SOV KT	W/C	SOV KT	W/C	SOV KT	W/C	SOV KT	W/C	SOV KT	W/C	SOV KT	W/C	
Non-Pricing	STP	0.04%	0-1.70%	0-0.6%	0.04	0.6	0.04	0.6	0.04	0.6	0.04	0.6	0.04	0.6	0.04	0.6	0.04	0.6
	WPTP	2-3.3%	0-9.7%	0-0.4%	3.3	0.4	3.3	0.4	3.3	0.4	3.3	0.4	3.3	0.4	3.3	0.4	3.3	0.4
	Teleworking	1-5%	0	0	2.5	0	2.5	0	2.5	0	0.5	0	0.5	0	0.5	0	0.5	0
	Guaranteed Ride Home	0-1.4%	0-5%	0-0.5%	1.4	0.5	1.4	0.5	1.4	0.5	1.4	0.5	1.4	0.5	1.4	0.5	1.4	0.5
	Personalised Travel Planning	0-3.10%	0-11.2%	0-2.3%	3.1	2.3	3.1	2.3	3.1	2.3	3.1	2.3	3.1	2.3	1	0.7	1	0.7
	Intensification	0-0.5%	not calculated	not calculated	0.5	1.2	0.5	1.2	0.5	1.2	0	0	0.3	0.7	0	0	0	0
	Pedestrian and cycling network improvements	not calculated	0%	0-6%	0.5	6.0	0.5	6.0	0.5	6.0	0.5	6.0	0.5	6.0	0.2	2	0.2	2
	Mediated walking interventions	not calculated	0%	not calculated		n/c		n/c		n/c		n/c		n/c		n/c		n/c
	HOV	0-1.6%	not calculated		1.6													
	Potential non-pricing impact (maximised)				12.9	10.6	11.3	10.6	11.3	10.6	8.8	9.4	9.1	10.1	6.4	3.8	6.4	3.8
Pricing	Assumed only one type of pricing intervention in place by 2015																	
	Parking levy/Cordon toll	0-2%	0-8.2%	0-1.3%	1.5	1	1.5	1	1.5	1	1.5	1	1.5	1	1.5	1	1.5	1
Public Transport		0-	0-		0.8	6.9	0.8	6.9	0.8	6.9	0.8	6.9	0.8	6.9			0.8	6.9
Total projected impact					15.2	18.5	13.6	18.5	13.6	18.5	11.1	17.3	11.4	18.0	7.9	4.8	8.7	11.7
Assigned impact for analysis					9	5	8	4	7	4	7	2	7	2	4	2	4	2

Appendix D

Northland		Measures	Hawkes Bay		Taranaki		Southland		Tasman		Gisborne		Nelson		Marlborough		Westcoast	
SOV	W/C		SOV	W/C	SOV	W/C	SOV	W/C	SOV	W/C	SOV	W/C	SOV	W/C	SOV	W/C	SOV	W/C
0.04	0.6	Non-Pricing	0.04	0.6	0.04	0.6	0.04	0.6	0.04	0.6	0.04	0.6	0.04	0.6	0.04	0.6	0.04	0.6
		STP																
		WPTP											1.5					
0.5	0	Teleworking	0.5	0	0.5	0	0.5	0	0	0	0.5	0	0.5	0	0	0	0	0
0	0	Guaranteed Ride Home	0.5	0.2	0	0	0.5	0.2	0	0	0	0	0.5	0.2	0	0	0	0
1	0.7	Personalised Travel Planning	1	0.7	1	0.7	1	0.7	1	0.7	1	0.7	1	0.7	1	0.7	1	0.7
0	0	Intensification	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.2	2	Pedestrian and cycling network improvements	0.5	6.0	0.2	2	0.2	2	0.2	2	0.2	2	0.5	6.0	0.2	2	0.2	2
	n/c	Mediated walking interventions		n/c		n/c		n/c		n/c		n/c		n/c		n/c		n/c
1.7	3.3	HOV																
		Potential non-pricing impact (maximised)	2.5	7.5	1.7	3.3	2.2	3.5	1.2	3.3	1.7	3.3	4.0	7.5	1.2	3.3	1.2	3.3
		Pricing																
		Assumed only one type of pricing intervention in place by 2015																
		Parking levy/Cordon toll											1.5	1				
		Public Transport																
1.7	3.3	Total projected impact	2.5	7.5	1.7	3.3	2.2	3.5	1.2	3.3	1.7	3.3	5.5	8.5	1.2	3.3	1.2	3.3
2	2	Assigned impact for analysis	2	2	2	2	2	2	0	2	0	2	4	2	0	2	0	2

Regional transport targets for sustainable transportation in New Zealand

TABLE D4: DESCRIPTION OF MODELLED SCENARIOS FOR SELECTED TDM MEASURES AND THEIR PROJECTED IMPACTS				
Measure	Description	Projected impacts on SOV KT and mode share in New Zealand		
		% of SOV KT reduction (relative to 2004/07 base)	PT trip increase (relative to 2004/07 base)	Walking/cycling trip increase (relative to 2004/07 base)
Non-Pricing				
STP	All schools in NZ develop and implement STPs - 3.4% reduction in car psgr trips; 2.4% mode share to walk/cycle; 1.0% to PT - (a) remove 30% of driver trips from network and (b) remove 40% of driver trips from network	0.04% reduction in total VKT.	1.70%	0.60%
WPTP	50% of businesses with 20+ employees in Auckland, Waikato, Horizons Manawatu, Wellington, BOP, Canterbury, and Otago have high quality WPTP; Nelson - 50% of businesses with >50 employees have WPTP	3.30%	9.70%	0.40%
WPTP	30% of businesses with 20+ employees in Auckland, Waikato, Horizons Manawatu, Wellington, BOP, Canterbury, and Otago have high quality WPTP; Nelson - 30% of businesses with >50 employees have WPTP	2.00%	5.80%	0.30%
Teleworking	Approximately 20% of all employees telework 1 day per month	1% in 'Metro' (A, W, C); 0.5% in other MUAs	0	0
Teleworking	All employees telework 1 day per month or 25% of employees telework 1 day per week	5% in 'Metro' NZ; 2.5% in other MUAs	0	0
Guaranteed Ride Home	"Emergency ride home," provides non-SOV commuters with a guaranteed 'ride' in the event of a personal or family emergency, illness, or unexpected employment-related delay.	1.40%	5%	0.50%
Personalised Travel Planning	25% of NZ population participates in a 'standard' programme (as per NZTA's <i>Economic Evaluation Manual</i> , volume 2 [EEM2]) in Auckland, Waikato, Canterbury, Wellington, BOP and Otago; 25% of NZ population participates in a 'low' programme (EEM2) elsewhere	3.10% (of all driver trips) standard; 1.0% low - mean: 2.0%	11.20%	2.30%
Intensification	Doubling population density is associated with a 60 percent decline in VMT per capita. Negative direct effect is offset by positive indirect effects (22 percent), yielding a net, or total, elasticity of -0.381 . Hence, effect of 1% increase in density in selected MUAs (in Auckland, Wellington and Canterbury regions), results in 0.5% decline in SOV KT. Other MUA densities are considered too small for there to be a measurable effect.	0.50%	not calculated	1.50%
Pedestrian and cycling network improvements	By 2015, further integration (e.g. traffic calming & traffic management in conjunction with infrastructure) and lengthening of cycling network in all MUA-regions - assumes 1% increase in mode share (e.g. from 2-3%) for cycling, one-half coming from drivers & one-half from vehicle passengers; potential increases in pedestrian trips as a result of increased safety. Decrease in driver's KT pro-rated to account for SOV target. Smaller regions: assume 2% increase in W/C	0.50%	0.00%	6.00%
Mediated walking interventions	Could be re-branded physical activity programme (such as the Government's 'push-play' programme) or refocus of personalised travel planning, prescribing walking & supported through internet/telephone contact - RCT indicate there is an effect, not able to be quantified at present.			not calculated
HOV	definite increases in vehicle occupancy recorded, though often at the expense of PT	1.60%	not calculated	not calculated
Parking levy	Based on Auckland Road Pricing Evaluation Study (ARPES) \$5 parking charge - widely applied in congested areas & major destinations - covering all car parks within reasonable walking distance	2.00%	8.20%	0.30%
Nottingham charge	Levied on employers at an increasing annual fee per car park provided for employees - where at least 10 parks provided - could be tackled through FBT	1.80%	8% (est)	0.5 (est)
Cordon toll	Using results from ARPES - could reduce vehicle traffic by 5-6% (\approx 4% SOV); increase PT from 7 to 12 or 9 %; increase w/c from 15 to 17; assuming ALL MUAs implement cordon, 6 am to 10 am affecting journey to work (JTW) and return trip - approx 42% of all car driver trips	1.3%	8.9%	1.3%
Cordon toll	As above, but cordon implemented in Auckland, Wellington, Christchurch, BOP, Hamilton	1.10%	7.40%	1.10%
Public Transport	PT service enhancements - assumes that PT service enhancements cause a relative increase of 3% per annum (cumulating each annum). Walking trips increase 1.35% per 1% point absolute increase in PT mode share; driver trips decrease by 0.4%.	0.8%	33.33%	6.9%

TABLE D5: INTERNATIONAL AND NZ LITERATURE REVIEW: SUMMARY OF TDM IMPACTS ON MODE SHIFT							
Used in workshop estimates	Measure		Basis	Mode shift (as % of all modes used)			
				Vehicle driver	Vehicle psgr	PT	Walking/cycling
√	School travel						
	STP	Hickson et al 2007	ARTA experience	Not applicable	3.40%	1.00%	2.40%
	STP	LTNZ TBHC EP & GHBK 2004	primary school (The summary statistics for school travel plans showed that car as passenger was significantly different from zero at the 5% level (2 tailed p value of 1.73%) and that walking was not significantly different from zero.)	Not applicable	9.00%	0.00%	9.00%
	STP	LTNZ TBHC EP & GHBK 2004	secondary school	Not applicable	9.00%	5.00%	4.00%
	STP	Moser, G & Bamberg, S 2008	review of international experience - evaluations not targeted to impact (focus on process and uptake)	Not relevant			
√	Workplace travel						
	WPTP	LTNZ TBHC EP & GHBK 2004	High quality WPTP including most or all of: car-parking constraints at workplace; parking mgmt strategies; improvements to w/c facilities; ride-matching service; PT service improvements; PT subsidies plus an element of traffic congestion	-12.90%	3.30%	7.40%	2.20%
	WPTP	LTNZ TBHC EP & GHBK 2004	Medium quality WPTP including at least 3 of the elements indicated above plus an element of traffic congestion	-5.00%	1.30%	2.60%	1.10%
	WPTP	Moser, G & Bamberg, S 2008	mode shift <i>within workplaces</i> - analysis based on same evaluations as	-12%			
	√	Teleworking	BAH 2006b	meta analysis suggested 1% reduction in SOV KT - approximately 20% of all employees telework 1 day per month	(-)1% SOV KT	0	
	Teleworking	SMART 2020	assumes 10% of existing vehicles affected in developed countries - 80% decrease of work-related car travel; 20% increase in non-work-related car travel - in NZ context: approx 42% of all car driver trips are work-related - calculation: =100%-(.42*.2)+(.5	-2.20%	0		0
√	Guaranteed Ride Home	Menzcer 2006	"Emergency ride home," provides non-SOV commuters with a guaranteed 'ride' in the event of a personal or family emergency, illness, or unexpected employment-related delay - assumed to provide one-half benefit of WPTP.	-1.50%		1.3%	0.20%

Regional transport targets for sustainable transportation in New Zealand

TABLE D5: INTERNATIONAL AND NZ LITERATURE REVIEW: SUMMARY OF TDM IMPACTS ON MODE SHIFT							
Used in workshop estimates	Measure		Basis	Mode shift (as % of all modes used)			
				Vehicle driver	Vehicle psgr	PT	Walking/cycling
Home-based travel √	Personalised Travel Planning (PTP)	LTNZ TBHC EP & GHBK 2004	Standard diversion rate	-3.10%	-0.50%	2.20%	1.40%
	PTP	LTNZ TBHC EP & GHBK 2004	The Low diversion rate should be used if the TBhC project is to implement fewer measures than “usual” household based initiatives or where existing public transport services and/or cycle/walk facilities are poor	-1%	-0.20%	0.50%	0.70%
	PTP	DFT 2007/Chatterjee & Parker 2008	still serious concerns with evaluation methodologies used - 8 (new) PTP projects with comparable results taking into account counterfactual	-4%	-1.00%	1%	4.00%
	PTP	Moser, G & Bamberg, S 2008	if 2 outliers (of 72 studies) are removed, effect is homogenous, indicating reporting bias	up to -5%			
	E-commerce	SMART 2020	3% reduction in emissions from shopping transport, assumed to be 20% of all private transport (≈24% is the share in NZ)	0.5% VKT			
	Intensification	Cervero & Murakami 2008	Doubling population density is associated with a 60 percent decline in VMT per capita. Negative direct effect is offset by positive indirect effects (22 percent), yielding a net, or total, elasticity of $\square 0.381$. Hence, effect of 1% increase in density in selected MUAs, results in 0.5% decline in SOV VKT (decline for all of NZ = 0.25%)	(-)0.5% SOV KT	not calculated		not calculated
Cycling & Walking √	Cycling network	ARTA 2006	ARTA estimates that completing its cycle network (constructing 157 routes of several km each) will result in doubling of cycling mode share, from 1% to 2%	not calculated	not calculated		1.00%
	Cycling network	ARTA 2006	ARTA completing 50% of its cycle network will increase cycling share by 50%	not calculated	not calculated		0.50%
	Cycling network	BAH 2006a	Europe - fully integrated network, including traffic calming & lanes - BAH 2006	not calculated	not calculated		10.00%
	Cycling network	BAH 2006a	Toronto - 90 km cycle lanes constructed	not calculated	not calculated		1.70%
	Cycling network	BAH 2006a	Hull UK - 24 km in 6 cycle lanes constructed - change in use: 2 - none; 3 had 20-30%; 1 had 138%; implied mode share shift (maximum - assumes all new cycling trips used to be vehicle drivers)	not calculated	not calculated		1.50%

TABLE D5: INTERNATIONAL AND NZ LITERATURE REVIEW: SUMMARY OF TDM IMPACTS ON MODE SHIFT							
Used in workshop estimates	Measure		Basis	Mode shift (as % of all modes used)			
				Vehicle driver	Vehicle psgr	PT	Walking/cycling
	Mediated walking interventions	Williams et al 2008; Dawson et al 2006; Reger et al 2006					not calculated
Infrastructure √	HOV	modeled (Don Wignall)	definite increases in vehicle occupancy recorded, though often at the expense of PT	-1.60%	not calculated		not calculated
Pricing √	Cordon toll		ARPES - could reduce vehicle traffic by 5-6% (≈4% SOV); increase PT from 7 to 12 or 9 %; increase w/c from 15 to 17	-4%	0	2-4%	2%
	Parking levy	ARPES	based on ARPES \$5 parking charge - widely applied in congested areas & major destinations - covering all car parks within reasonable walking distance	-3.00%	0.2	2.30%	0.50%
	Nottingham charge		Levied on employers at an increasing annual fee per car park provided for employees - where at least 10 parks provided - could be tackled through FBT	-1.80%		1.3% (est)	0.5 (est)
	removing commuter parking subsidies	TCRP 2005	accomplished through various means: charging for parking; cashing out parking; etc. - up to 19% reduction in mode share (SOV trips); price elasticity for employees -0.15	(-)2.3-2.9 VKT reduction	not calculated	not calculated	not calculated
	cashing out employee parking / pricing parking	Wilbur Smith Assoc 2007	5-15% reduction in SOV driving <i>in workplaces</i>	(-)5-15% at workplace	not calculated	not calculated	not calculated
Options not considered:	toll lanes	ARPES 2004	limited applicability in Auckland, hence not likely to be adopted elsewhere in NZ				
	full network pricing	ARPES 2004	not feasible technologically				

Regional transport targets for sustainable transportation in New Zealand

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Author(s) Title & Date	Project type	Is the paper a meta-analysis?	Project description (nature of project; size, etc)	'Baseline' characteristics/ description	Description of monitoring method (incl details re: sample sizes; confidence intervals provided; approach taken; etc OR page refs)	Impact/change/ outcomes generated by project (seeking QUANTITATIVE information; but QUALITATIVE ok if that's all there is) Mode use (% shift; change in vkt; etc)	Other relevant information
Williams, DM; Matthews, CE; Rutt, C; Napolitano, MA; and Marcus, BH Williams, DM; Matthews, CE; Rutt, C; Napolitano, MA; and Marcus, BH. 2008. Interventions to increase walking behaviour. <i>Medicine & Science in Sports & Exercise</i> 40(7S):S567-S573.	walk	✓	Reviews studies of walking promotion interventions. Non-face-to-face (i.e. mediated) interventions that targeted overall physical activity were also addressed briefly. In addition to telephone, mediated interventions can be delivered via print, e-mail, or internet.	14 randomised controlled trials (RCT) that randomised individual participants to one or more walking interventions and/or a control condition and examined walking behaviour outcomes were located. Findings from studies examining various components of interventions show that brief telephone prompts may be helpful in increasing walking behaviour, and that prescribing moderate intensity walking 5-7 days per week, either in single or multiple sessions per day may be the most effective means for increasing minutes of walking. Further research is required to market and deliver such programmes on a population level.		Random-controlled and uncontrolled studies indicate there is an effect, not able to be quantified at present. Mediated interventions are considered to be particularly helpful for promoting walking, as brisk walking is an activity people can perform without special equipment, physician support or face-to-face supervision.	Wheeling walks & health walks - mediated intervention (telephone &/or internet 'individual' attention) - re-focus 'push-play' message of SPARC or MOH programmes (are there any) to encourage this kind of message - multi-media campaign. Also indicates the perhaps ITM/PTP could adopt similar message - walking inexpensive, easy to do, no special equipment, etc.
Dawson, J, Boller, I, Foster, C & Hillsdon, M. 2006. Evaluation of changes to physical activity amongst people who attend the Walking the Way to Health Initiative (WHI). UK: The Countryside Agency	walk	no	A 'Health Walk' is a purposeful, brisk walk undertaken on a regular basis. Targeted population was 65-74 year olds		An evaluation two Health Walk initiatives was completed in early 2006 by Dawson et al who initially approached 750 participants attending newly funded walks with a self-completion questionnaire and seeking their commitment to complete subsequent questionnaires after 3 months and 12 months. 497 people completed all 3 questionnaires.	In the 3 month and 12 month surveys, participants were asked "do you do more walking since you were introduced to the Health Walks Scheme? If YES please describe the types of walking you do." Respondents were allowed to provide their own description. 28% (after 3 months) / 31% (after 12 months) only did health walks/group walking while the remainder had done other walks. Some of these (24% / 26%) could definitely be construed as transport-related, given that they included walking to local shops or the "neighbourhood pub".	Dawson et al. (2006) did not find that overall physical activity levels increased because recruits already had a high level of activity – in fact, 85% of participants had been on a led-walk prior to study initiation.
Reger, B; Cooper, L; Booth-Butterfield, S; Smith, H; Bauman, A; Wootan, M; Middlestadt, S; Marcus, B; and Greer, F. 2002. Wheeling Walks: A Community Campaign Using Paid Media to Encourage Walking Among Sedentary Older Adults. <i>Preventive Medicine</i> 35(3):285-292. (abstract only)	walk	no	Wheeling Walks was a community-based "health promotion" intervention conducted in Wheeling, West Virginia in 2001. The aim was to motivate sedentary adults, aged 50-65 to become more physically active through moderate-intensity walking for 30 minutes per day, for at least 5 days per week.	The campaign itself involved an 8-week media promotion with high levels of paid television (683 prime time ad slots and 1,164 ad slots on local cable television stations); local radio (1,988 ads); and newspaper (14 one-quarter page ads) advertisements containing the main messages of the programme. A 4-week long "booster campaign" of media advertisements ran during month eleven	The evaluation measured "market penetration", that is the awareness of the campaign and/or the campaign message (Reger et al (2002a) considered this to be important since if a person is not aware of a campaign, there is "no way the message can affect his/her behaviour"); self reported changes; and changes in the stages of readiness. Telephone surveys were conducted with the "target population", i.e. sedentary adults aged 50-65, in Wheeling and in a comparison community (n=719 and n=753, respectively), at baseline, immediately after the 8-week campaign, at 6-months and 12-months.	More respondents in the intervention community reported a shift from being "insufficiently" active at the baseline to walking 30+ minutes per day for at least 5 days per week after the intervention, than did in the control community (32% c/w 18%). This was maintained over the 12 month period. Shifts to a higher (positive) stage of change were 12% higher in Wheeling than the comparison community. Both of these findings were statistically significant (Reger et al 2002b).	Reger-Nash, B; Cooper, L; Orren, J; Cook, D. June 2005. Marketing used to promote walking in McDowell County. Letter to the Editor. <i>West Virginia Medical Journal</i> 101(3): 106.

Appendix D

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Booz Allen Hamilton. Apr 2006. International Approaches to Tackling Transport Congestion Paper 5 (Final): Walking and Cycling. Prepared for the Victoria Competition and Efficiency Commission (VCEC) Inquiry into managing transport congestion. Accessed October 2008 from http://www.vcec.vic.gov.au/	cycle facilities	✓				In every European country with at least 10% bike modal split, separate cycling facilities (and traffic-calmed neighbourhood streets) are integral parts of the bike route system (Pucher et al., 1999).	
Booz Allen Hamilton. Apr 2006. International Approaches to Tackling Transport Congestion Paper 5 (Final): Walking and Cycling. Prepared for the Victoria Competition and Efficiency Commission (VCEC) Inquiry into managing transport congestion. Accessed October 2008 from http://www.vcec.vic.gov.au/	cycle lanes & parking	✓				Toronto Canada - constructed >90 km bike routes/paths/lanes - In 1991, 2.3% of Toronto adults said they cycled to work at least occasionally, with twice that many in the old city of Toronto. The number of bicycle trips to the Toronto central area increased by 75% between 1987 and 1993, and more recent traffic counts suggest that usage has held steady at this higher level.; Seattle, Washington - over 210 km paths/routes/lanes constructed - originally 2.3% mode share for peak morning - peak morning cycling increased 28% between 1992 & 1995; Eugene Oregon - 80+ miles of paths/lanes - 8% mode share of commute trips	
Booz Allen Hamilton. Apr 2006. International Approaches to Tackling Transport Congestion Paper 5 (Final): Walking and Cycling. Prepared for the Victoria Competition and Efficiency Commission (VCEC) Inquiry into managing transport congestion. Accessed October 2008 from http://www.vcec.vic.gov.au/	walk & cycle	✓	The project involved the reallocation of road space from motor vehicles to cyclists, by introducing on-road cycle lanes on a large number of roads in Hull. The total length of new cycle lanes covered initially was 24km, over seven separate routes. Generally the schemes involve removal of one traffic lane in each direction and replacing this with marked car parking bays and a cycle lane separated from these by a margin strip. Advanced stop lines have also been introduced at signalled junctions.	cycle flows 500-900 per day		Increased cycle flows. Of the six sites monitored, one increased cycling by 138%, three by between 20 and 30%, and two were unchanged - implied average growth in cycling trips per day: 33% - no information on mode share	

Regional transport targets for sustainable transportation in New Zealand

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Booz Allen Hamilton. Aug 2006. Study of Successful Congestion Management Approaches and the Role of Charging, Taxes, Levies and Infrastructure & Service Pricing in Travel Demand Management Paper B3: Travel Substitution (Draft). Prepared for Department of Transport and Regional Services	telework	✓	Telework is one of a number of terms that describe a range of ICT-supported flexible working practices, which revolve around the ability to undertake work remotely, usually away from a main worksite at a regular favoured location. It may be part-time or full-time; home-based or centre-based or mobile.		Reporting commonly tells of the KT affected and/or commute time decreases, but does not necessarily state what mode share effect is (A Californian & two Australian studies noted high proportions of PT trips affected compared with car).	Telework reduces the car distance travelled by teleworkers, even allowing for extra 'rebound effect' non-work travel (Cairns et al., 2004):-- the distance travelled by teleworkers on teleworking days typically shows a reduction of between 48% and 77% compared to non-teleworking days-- overall reductions in distance, measured across both teleworking and non-teleworking days, ranges from 11% to 19%; However a number of studies have found that, because only a small percentage of the workforce may telework on a given day at present, and because those most likely to telework tend to have a longer commute trip than the average, the above effects translate into savings of approximately 1% in vehicle kilometres travelled.	While estimated to have a small net impact on vehicle travel in Australia - perhaps 1% of vehicle km travelled, available evidence also suggests that telework is likely to continue growing in popularity. There is therefore likely to be potential for future 'natural' growth in car travel and congestion impacts.
Todd Litman. Jul 2008. Online TDM Encyclopedia - Parking Pricing - Direct charges for using parking facilities - VTPI	area wide parking charge	✓		Parking pricing measures will have a direct impact on the frequency and duration of parking, and will often have an impact on modal share. The degree of impact on modal share will depend on a number of factors including: proportion of parking spaces covered, the availability of alternative parking spaces, the extent to which individuals pay their own parking costs, the availability and quality of alternative transport, and the level of the charge.			Todd's reporting superceded by going directly to the source article
Ministry of Transport. Mar 2006. Auckland Road Pricing Evaluation Study - Final Report	commuter parking charges	no	Charges fixed as a single known flat rate for any vehicle parked in the area for any period of time with only one payment required per day - need to include enough carparks to influence behaviour of meaningful # of people - in areas of congestion or major destinations; cover all carparks within reasonable walking distance of key employment locations; implement residents parking schemes.	In Arpes ch 5-6 p.4, \$5 applied home-work trips only - modeled a.m. peak using ART, increased PT mode share from 11.2 to 13.5; w/c 15.6 to 16.09%; removed 13885 vehicles at 10.2 km trip length - 3% volume; -3% VKT - requires enforcement (higher cost) but less technology to implement & less cost. Technical feasibility - coupon parking scheme could be implemented; difficult to monitor private building parks - could have a levy like Nottingham, with randomised enforcement (p.59)			(from 2004 pricing report) weaknesses of pkg charge: do not capture through traffic; commuter motorists may not have to pay charge directly; could operate as a periodic tax to businesses not passed to employees on a daily basis (p.30); potential legal issues of applying target to privately owned spaces & difficulty in establishing number of spaces; could suppress economic activity in area charges apply, if activity transfers elsewhere where there are no parking charges.

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ERIN VACA and J. RICHARD KUZMYAK. 2005. TRANSIT COOPERATIVE RESEARCH PROGRAM. Traveler Response to Transportation System Changes: Chapter 13—Parking Pricing and Fees. TCRP Report 95 Accessed October 2008 from www.TRB.org.	commuter parking charges	✓	Strategies for withdrawing the employer parking subsidy can take several different forms. The subsidy may simply be eliminated, requiring employees who drive to work to pay the market rate for parking out-of-pocket. Or, employers may give employees a "transportation allowance" that employees can apply towards the mode of their choice in the form of parking costs, transit passes, or whatever. Transportation allowances may or may not fully cover the cost of parking at a work site. A third option gaining increased attention is employer parking "cash-out," where employees are given the cost of a parking space in cash only if they choose to forego driving.	The U.S. government, in November 1979, started requiring federal employees to pay one-half the prevailing rates of commercial garages. A before-and-after analysis of 15 work sites in the Washington, DC, area was carried out using a sample of non-governmental sites as a control. The reduction in the number of autos used for commuting ranged from 1 to 10 percent in central city areas, and between 2 and 4 percent in suburban locations (Miller and Everett, 1982). Price elasticities of demand for work site parking calculated for these sites varied substantially but were relatively low: -0.32 or less (Feeney, 1989).	Parking demand price elasticities for individual employment sites and locales, while only marginally supportive of even -0.30 as an average elasticity transferable from areawide to site specific applications, are nonetheless accompanied by significant shifts in employee mode of travel. Reported employee parking elasticities, some of which may be computationally suspect, lie in the range of -0.1 to -0.3. However, seven case studies in particular, with reported parking price elasticities averaging -0.15, also revealed a decline in employees driving cars to work from 72 to 53 percent, a substantial drop in auto use in comparison to other policies with a trip reduction objective. Price elasticity can be a deceptive gauge when taken at face value without applying it to a particular price change situation.	while eliminating parking subsidies has significant impact at specific worksites, the potential impact at a regional level may be more modest: The predicted base year parking charge impacts proved to be modest; for example, estimated overall VMT reductions for the California regions ranged from -2.3 to -2.9 percent.	
Nottingham workplace parking levy 2008. http://www.nottinghamwpl.com/		no	Number of documents - some downloaded; other (more public consultation oriented) not downloaded - excludes parks for disabled; fire services; police; GPs & hospitals; customers; fleet vehicles not used for commuting; employers who have <10 carparks; requires establishing licence for employers to register their carparks & monitoring/enforcement. Requires legislation to establish	A WPL is a charge that would be made to City of Nottingham employers. Liable parking spaces would be those employers provide for their staff or certain types of business visitors. On each liable parking space the levy would be in the region of £185 per year starting in 2010 and rising to around £350 at the opening of NET Phase Two, with increases linked to inflation in future years.		Targets commuters (main cause of congestion) rather than all traffic; expected to constrain traffic growth by 2%; less costly to enforce than a cordon; 70-80% of employers would not be affected although they would have to obtain a licence	
Moser, G & Bamberg, S 2008. The effectiveness of soft transport policy measures: A critical assessment and meta-analysis of empirical evidence. Journal of Environmental Psychology 28:10-26.	PTP	✓	Employs quantitative meta-analytical techniques to reanalyse the data on the effectiveness of soft policy measures. PTP includes personalised travel planning, travel awareness campaigns and public transport information marketing. 72 studies were included in the analysis - the bulk of them Socialdata- or SDG-type individualised marketing initiatives..	Moser and Bamberg found that none of the 141 evaluation studies included in their meta-analysis included any kind of statistical significance testing (to check that findings were not random fluctuation); there was widespread of sample selectivity (leading to bias in results); sample sizes generally considered too small to provide statistical evidence; all of the studies used a 'weak quasi-experimental one- group-pre-post-test design', which threatens the internal validity of the results. Also notes absence of external validity (due to biased samples). They conclude caution required for interpreting results, as evaluation most likely to overestimate the true causal car use reduction effect.	Studies of PTP drawn from Cairns et al 2004; Ker 2003 (essentially the same as TBHC EP & GHBK). Meta-analysis included funnel plots to assess the presence of representativeness biases; defining & calculating the effect size statistic in order to calculate pooled effect sizes under the fixed-effects and random-effects assumptions; and use of box plots to explore heterogeneity.	Random effects pooled ES of 0.11 - indicates that on average the implementation of such a measure results in a 5%-point increase in the trip proportion not conducted by car. However, there is evidence of a reporting bias - if two outliers (of 72 studies) are removed, the analyses indicate a homogeneous ES-distribution for this intervention type (i.e. all results fall in a narrow, positive range)	

Regional transport targets for sustainable transportation in New Zealand

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Moser & Bamberg. 2008.	WTP	✓	Employs quantitative meta- analytical techniques to reanalyse the data on the effectiveness of soft policy measures. WTP are described as 'a bundle of measures put in place by an employer to encourage more sustainable travel, particularly less single occupancy car use. 44 studies were included in the analysis	Moser and Bamberg found that none of the 141 evaluation studies included in their meta-analysis included any kind of statistical significance testing (to check that findings were not random fluctuation); there was widespread of sample selectivity (leading to bias in results); sample sizes generally considered too small to provide statistical evidence; all of the studies used a 'weak quasi-experimental one- group-pre-post-test design', which threatens the internal validity of the results. Also notes absence of external validity (due to biased samples). They conclude caution required for interpreting results, as evaluation most likely to overestimate the true causal car use reduction effect.	Studies of WTP drawn from Cairns et al 2002 (Making Travel Plans Work), and Cairns et al 2004 (Smarter Choices) - essentially the same as TBHC EP & GHBK. Meta-analysis included funnel plots to assess the presence of representativeness biases; defining & calculating the effect size statistic in order to calculate pooled effect sizes under the fixed-effects and random-effects assumptions; and use of box plots to explore heterogeneity.	Random effects pooled ES of 0.24 - indicates that on average the implementation of such a measure results in a 12%-point increase in the proportion of employees not coming to work by car. The funnel plot provides little evidence that this result is based on a biased sample.	
Moser & Bamberg. 2008.	STP	✓	Employs quantitative meta- analytical techniques to reanalyse the data on the effectiveness of soft policy measures, including STP. 25 studies were included in the analysis	Moser and Bamberg found that none of the 141 evaluation studies included in their meta-analysis included any kind of statistical significance testing (to check that findings were not random fluctuation); there was widespread of sample selectivity (leading to bias in results); sample sizes generally considered too small to provide statistical evidence; all of the studies used a 'weak quasi-experimental one- group-pre-post-test design', which threatens the internal validity of the results. Also notes absence of external validity (due to biased samples). They conclude caution required for interpreting results, as evaluation most likely to overestimate the true causal car use reduction effect.		Studies were found to have focused on process evaluation, best practice, not impact of school travel plans.	
The Climate Group. 2008. SMART 2020: Enabling the low carbon economy in the information age. Prepared on behalf of the Global eSustainability Initiative (GeSI). Creative commons.	telework		What the existing case studies show is that the impact of working from home varies depending on the amount of time spent at home and the efficiency of the economy in which teleworking is introduced. For example, if a significant number of people worked from home more than three days a week, this could lead to energy savings of 20-50%, even with the increase in energy used at home or non-commuter travel. However, the impact is much lower if take-up is lower than three days a week because it would still be necessary to maintain office space for periodic home-workers.			Telecommuting reduction of 0.26 Gigatonne CO2 emissions• Assumes that work-related car travel in urban and non-urban areas decreases by 80%, while non-work-related car travel increases by 20% • In developed countries 10% of existing vehicles are affected, equivalent to 20% of people and 30-40% of working population, and 7% in developing countries • Assumes a 15% increase in residential building emissions and a 60% reduction in office emissions, applied to 10% of residential buildings and 80% of office buildings	

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The Climate Group. 2008. SMART 2020: Enabling the low carbon economy in the information age. Prepared on behalf of the Global eSustainability Initiative (GeSI). Creative commons.	e-commerce		E-commerce (also known as electronic commerce): Buying and selling of products and services over the internet and other computer networks.			E-commerce 0.03 • 3% reduction in emissions from shopping transport, assumed to be 40% of non-work-related private transport, or 20% of all private transport	
Final Report. 2004. Transport Demand Management Pricing Options - Auckland Strategy and Funding Project.	pricing road use		Options that did not proceed to second round analysis: Toll lanes - limited applicability in Auckland; Full network pricing - not feasible technologically; Local area licensing - not well targeted to prime congestion issues; Free public transport - negative revenue & limited demand management potential in the absence of other TDM pricing measures.			Cordon toll v. strategic network charges - could reduce vehicle traffic by 5-6%; increase PT from 7 to 12 or 9 %; increase w/c from 15 to 17	
Department for Transport. 2007. Making personal travel planning work.	PTP	✓	Includes voluntary travel behaviour change measures/individualised travel marketing, either of the Socialdata- or SDG-origin. 18 of the 23 case studies included occurred AFTER the preparation of the TBHC EP & GHBK for Land Transport NZ (thus, offering new information).		As (according to Chatterjee & Parker, 2008) all evaluations are based on one day trip diaries, all require min sample of 2000+ (independent b4 and after) or 700+ (matched panel) to detect changes of 10% in car trips (O'Fallon & Sullivan 2003) - none of the samples meet this, so results are indicative only. Sample sizes are getting larger, and control group is more common, but serious concerns with sample bias remain.	Taking the eight PTP projects for which there are comparable results taking account the counterfactual (three in Bristol, one in Darlington, one in Lancashire, two in Nottingham, one in Peterborough) a decrease in the modal share of car driver trips of up to 7 % has been reported with a project arithmetical mean decrease of 4 % in the share of trips which are car driver. The modal share for walking trips is reported to increase by up to 6 percentage points with project arithmetical mean increase of 3 percentage points. The project arithmetical mean changes for other modes are 1 percentage point increase for cycling, 1 % increase for public transport and 1 % decrease for car passenger. Change in driver trips measured (9 projects) - 3-12% - mean 9% relative change. Change in car distance travelled ATTRIBUTED (not measured) - 8-15% - mean 12% (6 projects)	
Percy, A; Clark, P; Valero, J; van Roon, A; Young, D. 2006. Quantifying regional benefits from TDM. Road & Transport Research 15(2):67-81.	cycle facilities	no	Also has estimates for STP and WTP, which are superceded by actual evaluations (2007 & 2008). Community travel initiatives estimates are based on TBHC EP & GHBK. No basis given for estimates regarding cycle network	157 'length' of cycle networks are planned for Auckland region, many of which are ±5 km in length. Modeled estimates based on 50% completion and 100% completion of cycle network.	All results are modelled. Impact on mode share (reduction in vehicle trips) is estimated to be much greater than impact on VKT.	50% of cycle network completed = 0.5% increase in mode share for cycling; 100% of cycle network completed = 1% increase in mode share. Both from a base of 1%.	
ARTA. 2008. Evaluation	WTP						

Regional transport targets for sustainable transportation in New Zealand

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William B. Menczer. May 2006. Guaranteed Ride Home Programs A study of program characteristics, utilization, and cost. Office of Policy and Performance Management, TBP-10 Federal Transit Administration	GRH	✓	# of studies found GRH influential in mode choice - some found that % of people using alternative mode due to presence of GRH			A 2002 survey conducted by the Artery Business Committee in downtown Boston found that 9% of those responding to the survey switched from SOV commuting to an alternate mode of transportation due to the existence of a GRH program. A 2002 survey of Haverstraw-Ossining Ferry riders in New York found 41% of those surveyed stated that the GRH was among the top reasons for taking the ferry instead of their previous mode of transportation. Four percent ranked GRH as their number one reason for taking the ferry. A program evaluation conducted in 2004 for the Alameda County Congestion Management Agency found that 47% of those surveyed would not use alternate modes of transportation without a GRH program. In 2003, the number was 41%. Nelson/Nygaard Consulting Associates, "Alameda County CMA Guaranteed Ride Home Program Evaluation: Executive Summary," May 2005.1995, Baltimore: 27% of those changing commute mode said availability of GRH was important/very important decision factor; 1999, New York express bus riders - 16% would stop using if GRH stopped.	
Australian Telework Advisory Committee. 2006. Telework for Australian Employees and Businesses Maximising the economic and social benefits of flexible working practices. Report prepared for the Australian Government.			Looks at drivers and barriers and existing teleworking numbers and makes recommendations to encourage teleworking, but no modeling or estimates of impact. Literature review (2005) is the same, doesn't report on trials.				
Wilbur Smith Associates et al. Jun 2007. Developing Parking Policies to Support Smart Growth in Local Jurisdictions: Best Practices. Prepared for: Metropolitan Transportation Commission.			Parking cash-out allows employees to choose between a parking subsidy (free parking), or the out-of-pocket equivalent cost of the parking space. Employees may choose to apply the money towards their parking space or make arrangements to use a lower cost alternative mode and keep the cash.			There are 26 employers who participate in the program, resulting in a 20 percent reduction in parking use at these employment sites. A study conducted by Donald Shoup (1997), concluded that two Santa Monica employers who used cash-out reduced solo driving by 7 to 8 percent. Another study found 7 employers had parking requirements reduced by 26%. The estimated general impact on parking demand is considered to be in the range of 10-15% depending on the price, convenience and demand for parking	My query: how do you pre-empt employees from taking the money and parking for free elsewhere, unless all parking is metered?

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ARTA. Mar 2008. Workplace Travel Planning Evaluation Report to Land Transport NZ Financial Year: 2007-2008	WTP	4WP	A Workplace Travel Plan (WTP) is a series of responsive, coordinated and planned activities providing greater travel choice to people for the journey to and from work, and more effective management of work-related transport, including freight. ARTA's WTP programme is a voluntary one, aimed at businesses where transport and parking issues are impacting on productivity and profitability. The programme provides a range of support and guidance through a 5-stage process from set-up, research, planning, implementation and continuous improvement.	The 2016 target, set in the Auckland Regional Land Transport Strategy for the Workplace Travel Programme, is to achieve a 12% average reduction in peak period car trips to work/study organisations. This translates to a reduction of 3,500 cars from morning peak traffic.	The quantitative process included undertaking follow-up surveys of 5 organisations to assess changes in behaviour resulting from actions they undertook while part of the TravelWise WTP programme. These organisations were initially surveyed to gather baseline data, including a record of how staff travelled to work during a typical working week (Mon to Fri). The follow-up survey included the same core questions as the baseline survey, and analysis on any changes in mode forms the basis of this evaluation. Baseline surveys received from 2300 respondents and a follow-up survey of 1300 responses from a total population of 6600. Note that Auckland Airport had 224 responses from 4500+ staff in follow up survey - hence reporting here excludes this worksite. No date for follow up survey is provided. Response rates for individual organisations are not provided; nor are the extent of the changes in survey delivery mentioned in the report. 4 remaining organisations were two (transport) consulting firms and two City Councils (together these form 82% of staff in the WTPs), one of which re-located to an area with less available parking & at a rail/bus exchange.	SOV reduction -17.81%; PT increase 6.67%; carpool/rideshare 7.48%. From the report: "It is recognised that the results observed in the above organisations are not solely attributable to travel plans. A combination of other factors such as changing staff, changes at the workplace, on-going improvements to the transport network (to name a few) have played a part in some of these modal shifts." If Auckland Airport is excluded, the reduction in number of trips per day is 744, with an average of 17.6 km/trip (much higher than the Auckland MUA average of 10.3 km/trip from NZHTS).	Reviewer comments: the lack of clarity surrounding the methodology (which apparently changed between before and after survey) and response rates and the choice of workplaces (City Councils and transport consultancies) prompted us to use the TBHC EP & GHBK diversion rates (for a comprehensive travel plan including parking measures and adequate PT) for the regional target exercise.
Hinckson, E., Duncan, S., Kearns, R., & Badland, H. 2008. Auckland Regional Transport Authority School Travel Plan Evaluation: 2007 School Year. Auckland, New Zealand: AUT University.	STP		The School Travel Plan (STP) takes a collaborative approach to the development of travel strategies tailored to meet the needs of individual schools. This consists of educational and promotional campaigns to promote active transport (e.g. walking, Walking School Bus (WSB), scooter, and/or cycling), building of traffic calming measures, installation of crossings, improvement of roads and footpaths, cycle training for students, and parking restrictions. At each school, development and implementation of the STP initiative is facilitated by an ARTA school travel coordinator and the local council.		74 schools were invited to participate in the STP survey. Schools withdrew/were excluded for various reasons - overall, 52 Primary, seven Intermediate, and nine Secondary schools comprised the final sample (68 in total). School size ranged from 122 to 2,241 students. Schools launched their STP in 2004 (21), 2005 (24) and 2006 (23). The follow-up survey in 2007 sampled 35,153 students across 68 schools (10,765 Primary, 13,705 Intermediate, 10,683 Secondary students) using a roll survey which asked how the child traveled to and from school on the survey day. The 2007 evaluation surveys were undertaken during the winter season on any day (regardless whether the day was wet or dry) of a particular week. This was in contrast to previous surveys that were collected during the summer months. On reporting aggregate mode percentages, the baseline and follow-up STP values of students' actual travel modes were weighted according to each school's roll as determined by the Ministry of Education in the year the survey was undertaken. At 95% confidence interval, the margin of error on reporting aggregate modes was 0.22%.	Participation in the STP programme was associated with a 3.4% decrease in car usage and a 2.4% increase in active transport. A smaller increase in public transport use was also observed (1.0%). Participation in the STP or WSB programmes in 2007 was associated with a reduction in over 4,500 vehicle trips every morning, equivalent to a reduction of 2.4 million in vehicle trips and a reduction in 3.3 million in vehicle kilometres travelled (VKT) each year.	The change in season for the follow up survey is quite likely to have 'dampened' the amount of active transport used by children. At the same time, it should be noted that the reduction in car trips BY CHILDREN does not equate to a reduction in car trips BY ADULTS, of which 27% (in NZHTS 1997/98) went straight home, while the remainder went on to work. Also, while roll survey is comprehensive, it is still necessary to have matched day-of-the-week, there is significant variability in travel by day of week.

Appendix E: Model findings

Introduction

A series of sensitivity tests have been undertaken using a policy model¹ to test the likely performance of policy options against targets and outcomes.

In order to undertake the tests, a series of working assumptions have been adopted and these are reported more fully in the other appendices.

Regional and local models are primarily established to replicate current conditions and to forecast 'business as usual' (BAU) conditions. These 'platforms' allow future transport system and network improvement options to be tested in operational performance and economic appraisal terms.

In most circumstances² the BAU to 2015 represents: the current regional land transport strategy (RLTS), the long-term council community plan (LTCCP) and the land transport programme (LTP). The BAU has been modelled in all four of the locations used in the strategy review model (SRM).

The work has also included forecasting to 2025 and 2040, but this note concentrates on regional and national forecasts for the year 2015.

Test results are included in the attached tables for the 2008 *Government policy statement* (GPS) targets for public transport, walking and cycling, single occupancy vehicles and other selected outcomes.

Test results are given for the traditional four main cities (Auckland, Wellington, Christchurch and Dunedin) and these have been factored in order to approximate to a national total.

Public transport (trip legs)

Expected 'business as usual' to 2015 appears unlikely to achieve the national target of a 30.5% increase in public transport (PT) patronage.

The application of a range of non-priced measures, particularly service level improvements, could achieve the national target providing Auckland makes up a relatively large share of the required increase.

The introduction of relatively modest price-based changes is likely to mean that the 2015 national PT target could be exceeded.

(Note: the impact of increased walking and cycling transport demand management (TDM) on PT in Christchurch and Dunedin may be overstated.)

Walking and cycling (trip legs)

Expected 'business as usual' to 2015 appears likely to achieve the national target of a 9.4% increase in walking and cycling.

The application of a range of non-priced measures, particularly TDM improvements, could exceed the national target if relatively large increases could be achieved in the main metropolitan areas.

¹ The model is called strategy review model (SRM) – see page 137.

² This will be the case providing the RLTS is realistic in terms of taking account of the funding likely to be available.

The introduction of relatively modest price-based changes is likely to mean that the 2015 national PT target could be further exceeded.

(Note: The BAU projections derived from regional models are in contrast to past trends.)

Single occupancy vehicle travel (SOV KT)

Expected 'business as usual' to 2015 appears likely to trend away from the national target of a 10% decrease in 2007 SOV KT per capita levels.

The application of a range of non-priced measures, particularly high occupancy vehicle (HOV) initiatives, could moderate the increase in SOV KT slightly.

Price-based changes could make more progress towards the 2015 national SOV KT target although in order to achieve the target these would need to be greater than indicated in the attached table.

(Note: The potential impact of travel planning initiatives has not been included in the tests undertaken to date and the figures quoted are 'annual day' rather than 'annual weekday' estimates.)

Network reliability (VKT LOS E&F)

Level of service (LOS) can be used as a measure of performance of the road network. It generally involves a qualitative assessment of the quantitative effect of factors such as speed, volume of traffic, geometric features, traffic interruptions, delays and freedom to manoeuvre which, taken together, provide an assessment of network reliability.

There are six levels of service, with A representing the top level as a condition of free flow in which individual drivers are virtually unaffected by the presence of others in the traffic stream and F representing the worst level (where drivers experience queueing and delays). Hence, the aim of interventions is to increase the proportion of roads having good LOS (eg A, B, C, or D) or to decrease the proportion of roads experiencing LOS E&F.

Expected 'business as usual' to 2015 appears likely to trend away from the national target of avoiding any further deterioration in reliability beyond 2007 levels.

The application of a range of non-priced measures, particularly ITS initiatives, could moderate the projected increase in the proportion of the network at LOS E&F slightly.

The relatively modest price-based changes tested could virtually achieve the 2015 national network reliability target.

(Note: The 2015 reliability target is for critical routes rather than for the overall network.)

Network speed (km/h)

Expected 'business as usual' to 2015 appears likely to trend away from the national target of avoiding further deterioration in average speeds.

The application of a range of non-priced measures may result in further slight reductions in average speeds.

The relatively modest price-based changes tested would make substantial progress towards the 2015 national average speed target, although in order to achieve the target these would need to be greater than indicated in the attached table.

(Note: The 2015 average speed target is for critical routes rather than for the overall network.)

Emissions (CO₂ per capita)

Expected 'business as usual' to 2015 appears likely to trend away from the long-term national target of halving CO₂ per capita by 2040.

The application of a range of non-priced measures is likely to have little effect in reducing CO₂ per capita.

The relatively modest price-based changes tested would make some progress towards the 2040 CO₂ per capita target, but other technology and fuel measures are likely to be needed in addition to those included in the attached sensitivity test.

(Note: There was no specific CO₂ target for 2015 in the GP.)

Vehicle kilometres travelled (VKT)

VKT appears likely to increase under an expected 'business as usual' scenario to 2015.

The application of a range of non-priced measures could moderate the increase in VKT.

The relatively modest price-based changes tested could further moderate the growth in VKT.

(Note: There were no specific VKT targets in the GPS.)

Discussion

The sensitivity testing has taken some of the metropolitan and urban areas with the greatest potential to make progress against the targets and then assumed that their proportion of the national target is held constant over the period 2007–2015. In reality, especially over the longer term, the proportion of the national total represented by higher potential areas is likely to grow, relative to the proportion from other areas.

However, on the basis of the testing undertaken, the overall indications are that:

- the three metropolitan areas will need to make the greatest progress towards the targets
- urban areas will have to make the next largest contribution
- all other areas need to make some progress towards targets.

If the targets are achieved, or if there is substantial progress towards them, then changes in modal demand levels will occur. One potential consequence of this could be to alter the economics of different transport investments, the potential effects of which could be taken into account through sensitivity testing during cost benefit analysis.

Modelled sensitivity testing

The following tables show a range of tests undertaken on background data obtained from four locations which have then been factored to represent approximate national effects.

The tests undertaken are illustrative and could be varied to produce different individual and combined results as required.

The test measures have been selected on the basis of relatively modest changes to a 'business as usual' approach that could be expected to have an impact on one or more of the five targets, public transport, walking and cycling, SOVs, reliability and speed.

The different modelled sensitivity tests can have significantly different impacts in different locations due to local circumstances.

The figures in the following tables are subject to further review and adjustment.

Regional transport targets for sustainable transportation in New Zealand

		Base year figures	GPS (2008) targets	Current policy settings and programmes	Service frequency, capacity and speed improvements as represented by network seat km within a given period	Walking and cycling network infrastructure and supporting programmes	Including outer car pooling, HOV lanes, priority destination/central area parking and supporting transit services	High technology initiatives directed at reducing delay and improving reliability	Area wide speed management and traffic calming	Effect of non-priced measures measures target	Compared with 2007 in real terms	Compared with 2007 in real terms	Compared with 2007 in real terms	Effect of all price based measures	Effect of all measures including price based options
Public transport (trip legs)		2007	2015 Target	2015 BAU	PT service +20%	TDM major	HOV major	ITS major	NMS major	Non-price summary	PT Fare -20%	VOC +10% (3c per km)	Fuel +20%	All price summary	All measures summary
Auckland	% Change from 2015 BAU				13.4%	-2.7%	0.0%	0.0%	0.0%	10.7%	9.6%	2.9%	2.3%	14.8%	25.5%
	Index to 2007	100	130.5	129.1	146.4	125.6	129.1	129.1	129.1	142.9	141.5	132.9	132.1	148.3	162.1
Wellington	% Change from 2015 BAU				13.4%	-2.8%	0.0%	0.0%	0.0%	10.5%	9.6%	2.9%	2.3%	14.8%	25.4%
	Index to 2007	100	130.5	109.0	123.6	105.9	109.0	109.0	109.0	120.5	119.5	112.2	111.5	125.2	136.7
Christchurch	% Change from 2015 BAU				14.2%	-6.7%	0.0%	0.0%	0.0%	7.5%	9.6%	3.2%	2.6%	15.5%	22.9%
	Index to 2007	100	130.5	105.3	120.3	98.3	105.3	105.3	105.3	113.2	115.4	108.7	108.0	121.6	129.5
Dunedin	% Change from 2015 BAU				14.4%	-18.8%	0.0%	0.0%	0.0%	-4.4%	10.3%	3.3%	2.7%	16.4%	12.1%
	Index to 2007	100	130.5	125.4	143.5	101.9	125.4	125.4	125.4	119.9	138.4	129.6	128.8	146.1	140.6
National	% Change from 2015 BAU				13.5%	-3.7%	0.0%	0.0%	0.0%	9.8%	9.6%	2.9%	2.3%	15.0%	24.8%
	Index to 2007	100	130.5	119.1	135.2	114.8	119.1	119.1	119.1	130.9	130.6	122.6	121.9	137.0	148.7

		Base year figures	GPS (2008) targets	Current policy settings and programmes	Service frequency, capacity and speed improvements as represented by network seat km within a given period	Walking and cycling network infrastructure and supporting programmes	Including outer car pooling, HOV lanes, priority destination/central area parking and supporting transit services	High technology initiatives directed at reducing delay and improving reliability	Area wide speed management and traffic calming	Effect of non-priced measures measures target	Compared with 2007 in real terms	Compared with 2007 in real terms	Compared with 2007 in real terms	Effect of all price based measures	Effect of all measures including price based options
Walking and cycling (trip legs)		2007	2015 Target	2015 BAU	PT service +20%	TDM major	HOV major	ITS major	NMS major	Non-price summary	PT Fare -20%	VOC +10% (3c per km)	Fuel +20%	All price summary	All measures summary
Auckland	% Change from 2015 BAU				-0.2%	8.1%	0.0%	0.0%	0.0%	7.9%	-0.1%	2.1%	1.7%	3.4%	11.3%
	Index to 2007	100	109.4	115.5	115.3	124.9	115.5	115.5	115.5	124.7	115.4	117.9	117.4	119.4	128.6
Wellington	% Change from 2015 BAU				-0.2%	8.1%	0.0%	0.0%	0.0%	7.9%	-0.1%	1.3%	1.0%	2.0%	10.0%
	Index to 2007	100	109.4	107.9	107.7	116.7	107.9	107.9	107.9	116.5	107.8	109.2	109.0	110.1	118.7
Christchurch	% Change from 2015 BAU				-0.1%	8.1%	0.0%	0.0%	0.0%	8.0%	-0.1%	1.8%	1.4%	3.0%	11.0%
	Index to 2007	100	109.4	105.3	105.3	113.9	105.3	105.3	105.3	113.8	105.3	107.2	106.9	108.5	117.0
Dunedin	% Change from 2015 BAU				0.0%	8.1%	0.0%	0.0%	0.0%	8.1%	0.0%	1.3%	1.1%	2.3%	10.4%
	Index to 2007	100	109.4	104.6	104.5	113.1	104.6	104.6	104.6	113.0	104.5	106.0	105.7	107.0	115.4
National	% Change from 2015 BAU				-0.1%	8.1%	0.0%	0.0%	0.0%	8.0%	-0.1%	1.7%	1.4%	2.8%	10.8%
	Index to 2007	100	109.4	109.9	109.8	118.8	109.9	109.9	109.9	118.7	109.8	111.8	111.5	113.1	121.8

Regional transport targets for sustainable transportation in New Zealand

		Base year figures	GPS targets	Current policy settings and programmes	Service frequency, capacity and speed improvements as represented by network seat km within a given period	Walking and cycling network infrastructure and supporting programmes	Including outer car pooling, HOV lanes, priority destination/central area parking and supporting transit services	High technology initiatives directed at reducing delay and improving reliability	Area wide speed management and traffic calming	Effect of non-priced measures measures target	Compared with 2007 in real terms	Compared with 2007 in real terms	Compared with 2007 in real terms	Effect of all price based measures	Effect of all measures including price based options
Single occupancy vehicles (VKT per capita)		2007	2015 Target	2015 BAU	PT service +20%	TDM major	HOV major	ITS major	NMS major	Non-price summary	PT Fare -20%	VOC +10% (3c per km)	Fuel +20%	All price summary	All measures summary
Auckland	% Change from 2015 BAU				-0.3%	-0.1%	-1.3%	0.0%	0.0%	-1.8%	-0.2%	-5.2%	-4.2%	-9.1%	-11.0%
	Index to 2007	100	90.0	104.0	103.7	103.9	102.6	104.0	104.0	102.1	103.8	98.6	99.6	94.5	92.6
Wellington	% Change from 2015 BAU				-0.5%	-0.2%	-2.2%	0.0%	0.0%	-2.8%	-0.3%	-4.4%	-3.5%	-7.8%	-10.6%
	Index to 2007	100	90.0	99.9	99.5	99.7	97.7	99.9	99.9	97.1	99.6	95.6	96.4	92.1	89.3
Christchurch	% Change from 2015 BAU				-0.2%	-0.1%	-1.7%	0.0%	0.0%	-2.0%	-0.1%	-4.7%	-3.8%	-8.2%	-10.2%
	Index to 2007	100	90.0	112.2	112.0	112.1	110.3	112.2	112.2	109.9	112.1	107.0	108.0	103.1	100.8
Dunedin	% Change from 2015 BAU				0.0%	-0.1%	-1.3%	0.1%	0.1%	-1.5%	0.0%	-4.1%	-3.3%	-7.2%	-8.8%
	Index to 2007	100	90.0	108.7	108.7	108.6	107.4	108.8	108.8	107.1	108.7	104.2	105.1	100.9	99.2
National	% Change from 2015 BAU				-0.3%	-0.1%	-1.5%	0.0%	0.0%	-2.0%	-0.2%	-4.9%	-3.9%	-8.5%	-10.5%
	Index to 2007	100	90.0	107.8	107.5	107.7	106.2	107.8	107.8	105.7	107.6	102.6	103.6	98.6	96.5

		Base year figures	GPS (2008) targets	Current policy settings and programmes	Service frequency, capacity and speed improvements as represented by network seat km within a given period	Walking and cycling network infrastructure and supporting programmes	Including outer car pooling, HOV lanes, priority destination/central area parking and supporting transit services	High technology initiatives directed at reducing delay and improving reliability	Area wide speed management and traffic calming	Effect of non-priced measures measures target	Compared with 2007 in real terms	Compared with 2007 in real terms	Compared with 2007 in real terms	Effect of all price based measures	Effect of all measures including price based options
Reliability (network congestion)		2007	2015 Target	2015 BAU	PT service +20%	TDM major	HOV major	ITS major	NMS major	Non-price summary	PT Fare -20%	VOC +10% (3c per km)	Fuel +20%	All measures summary	All measures summary
Auckland	% Change from 2015 BAU				-0.7%	-0.2%	0.0%	-6.0%	0.0%	-6.9%	-0.5%	-9.9%	-8.0%	-17.4%	-24.3%
	Index to 2007	100	100.0	135.8	134.9	135.4	135.8	127.6	135.8	126.4	135.1	122.3	124.9	112.1	102.7
Wellington	% Change from 2015 BAU				-1.2%	-0.5%	0.0%	-6.0%	0.0%	-7.6%	-0.8%	-11.4%	-9.2%	-20.5%	-28.1%
	Index to 2007	100	100.0	126.9	125.4	126.3	126.9	119.3	126.9	117.2	125.8	112.4	115.2	100.9	91.2
Christchurch	% Change from 2015 BAU				-0.2%	-0.2%	0.0%	-6.0%	0.0%	-6.4%	-0.1%	-5.6%	-4.5%	-9.7%	-16.0%
	Index to 2007	100	100.0	123.3	123.1	123.1	123.3	115.9	123.3	115.5	123.2	116.5	117.8	111.4	103.6
Dunedin	% Change from 2015 BAU				-0.2%	-0.6%	0.0%	-6.0%	0.0%	-6.8%	-0.2%	-14.5%	-11.7%	-25.1%	-31.9%
	Index to 2007	100	100.0	170.0	169.6	169.1	170.0	159.8	170.0	158.4	169.7	145.4	150.1	127.3	115.7
National	% Change from 2015 BAU				-0.6%	-0.3%	0.0%	-6.0%	0.0%	-6.9%	-0.4%	-9.3%	-7.5%	-16.4%	-23.2%
	Index to 2007	100	100.0	133.1	132.3	132.8	133.1	125.1	133.1	124.0	132.6	120.7	123.1	111.3	102.2

Regional transport targets for sustainable transportation in New Zealand

		Base year figures	GPS targets	Current policy settings and programmes	Service frequency, capacity and speed improvements as represented by network seat km within a given period	Walking and cycling network infrastructure and supporting programmes	Including outer car pooling, HOV lanes, priority destination/central area parking and supporting transit services	High technology initiatives directed at reducing delay and improving reliability	Area wide speed management and traffic calming	Effect of non-priced measures measures target	Compared with 2007 in real terms	Compared with 2007 in real terms	Compared with 2007 in real terms	Effect of all price based measures	Effect of all measures including price based options
Speed (network average)		2007	2015 Target	2015 BAU	PT service +20%	TDM major	HOV major	ITS major	NMS major	Non-price summary	PT Fare -20%	VOC +10% (3c per km)	Fuel +20%	All price summary	All measures summary
Auckland	% Change from 2015 BAU				0.3%	0.2%	0.1%	0.1%	-1.9%	-1.6%	0.3%	3.8%	3.1%	6.5%	4.9%
	Index to 2007	100	0.0	0.0	91.4	0.0	0.0	0.0	0.0	89.7	0.0	0.0	0.0	97.1	95.6
Wellington	% Change from 2015 BAU				0.3%	0.1%	0.0%	0.0%	-2.0%	-1.5%	0.2%	3.1%	2.5%	5.5%	4.0%
	Index to 2007	100	100.0	93.6	93.9	93.7	93.6	93.6	91.7	92.2	93.8	96.5	95.9	98.8	97.3
Christchurch	% Change from 2015 BAU				0.2%	0.2%	0.1%	0.1%	-1.9%	-1.7%	0.2%	3.6%	3.0%	6.3%	4.5%
	Index to 2007	100	100.0	90.0	90.2	90.2	90.1	90.1	88.3	88.5	90.1	93.3	92.7	95.7	94.1
Dunedin	% Change from 2015 BAU				0.0%	0.1%	0.0%	0.0%	-2.0%	-1.8%	0.0%	3.1%	2.5%	5.3%	3.5%
	Index to 2007	100	100.0	92.9	93.0	93.0	92.9	92.9	91.0	91.2	92.9	95.8	95.2	97.9	96.2
National	% Change from 2015 BAU				0.3%	0.2%	0.1%	0.1%	-1.9%	-1.6%	0.2%	3.6%	2.9%	6.2%	4.5%
	Index to 2007	100	100.0	91.4	91.6	91.5	91.4	91.4	89.6	89.9	91.5	94.6	94.0	97.0	95.5

		Base year figures	GPS (2008) targets	Current policy settings and programmes	Service frequency, capacity and speed improvements as represented by network seat km within a given period	Walking and cycling network infrastructure and supporting programmes	Including outer car pooling, HOV lanes, priority destination/central area parking and supporting transit services	High technology initiatives directed at reducing delay and improving reliability	Area wide speed management and traffic calming	Effect of non-priced measures measures target	Compared with 2007 in real terms	Compared with 2007 in real terms	Compared with 2007 in real terms	Effect of all price based measures	Effect of all measures including price based options
CO ₂ per capita		2007	2015 Target	2015 BAU	PT service +20%	TDM major	HOV major	ITS major	NMS major	Non-price summary	PT Fare -20%	VOC +10% (3c per km)	Fuel +20%	All price summary	All measures summary
Auckland	% Change from 2015 BAU				-0.1%	-0.1%	0.0%	0.0%	0.0%	-0.2%	-0.2%	-4.1%	-3.3%	-7.2%	-7.4%
	Index to 2007	100	50.0	101.6	101.5	101.5	101.6	101.6	101.6	101.4	101.4	97.5	98.3	94.3	94.1
Wellington	% Change from 2015 BAU				-0.2%	-0.2%	0.0%	0.0%	0.0%	-0.3%	-0.3%	-3.8%	-3.1%	-6.8%	-7.1%
	Index to 2007	100	50.0	101.6	101.4	101.4	101.6	101.6	101.6	101.2	101.3	97.7	98.5	94.7	94.3
Christchurch	% Change from 2015 BAU				-0.1%	-0.1%	0.0%	0.0%	0.0%	-0.2%	-0.1%	-4.0%	-3.2%	-6.9%	-7.1%
	Index to 2007	100	50.0	107.8	107.7	107.7	107.8	107.8	107.8	107.6	107.7	103.5	104.3	100.4	100.2
Dunedin	% Change from 2015 BAU				0.0%	-0.1%	0.0%	0.0%	0.0%	-0.2%	0.0%	-3.6%	-2.9%	-6.2%	-6.4%
	Index to 2007	100	50.0	108.6	108.5	108.4	108.6	108.6	108.6	108.4	108.5	104.7	105.4	101.8	101.7
National	% Change from 2015 BAU				-0.1%	-0.1%	0.0%	0.0%	0.0%	-0.2%	-0.2%	-4.0%	-3.2%	-7.0%	-7.2%
	Index to 2007	100	50.0	105.4	105.3	105.3	105.4	105.4	105.4	105.2	105.3	101.3	102.0	98.1	97.9

Regional transport targets for sustainable transportation in New Zealand

		Base year figures	GPS targets	Current policy settings and programmes	Service frequency, capacity and speed improvements as represented by network seat km within a given period	Walking and cycling network infrastructure and supporting programmes	Including outer car pooling, HOV lanes, priority destination/central area parking and supporting transit services	High technology initiatives directed at reducing delay and improving reliability	Area wide speed management and traffic calming	Effect of non-priced measures measures target	Compared with 2007 in real terms	Compared with 2007 in real terms	Compared with 2007 in real terms	Effect of all price based measures	Effect of all measures including price based options
VKT		2007	2015 Target	2015 BAU	PT service +20%	TDM major	HOV major	ITS major	NMS major	Non-price summary	PT Fare -20%	VOC +10% (3c per km)	Fuel +20%	All price summary	All measures summary
Auckland	% Change from 2015 BAU				-0.3%	-0.1%	0.0%	0.0%	0.0%	-0.4%	-0.2%	-4.2%	-3.4%	-7.3%	-7.7%
	Index to 2007	100	0.0	112.3	112.0	112.2	112.3	112.3	112.3	111.9	112.1	107.7	108.5	104.1	103.7
Wellington	% Change from 2015 BAU				-0.4%	-0.2%	0.0%	0.0%	0.0%	-0.5%	-0.3%	-3.7%	-3.0%	-6.7%	-7.2%
	Index to 2007	100	0.0	108.9	108.5	108.8	108.9	108.9	108.9	108.4	108.7	104.9	105.7	101.7	101.1
Christchurch	% Change from 2015 BAU				-0.1%	-0.1%	0.0%	0.0%	0.0%	-0.2%	-0.1%	-3.9%	-3.2%	-6.9%	-7.1%
	Index to 2007	100	0.0	113.9	113.7	113.8	113.9	113.9	113.9	113.6	113.8	109.4	110.3	106.1	105.8
Dunedin	% Change from 2015 BAU				-0.1%	-0.1%	0.0%	0.0%	0.0%	-0.2%	0.0%	-3.6%	-2.9%	-6.3%	-6.5%
	Index to 2007	100	0.0	109.9	109.9	109.8	109.9	109.9	109.9	109.7	109.9	105.9	106.7	103.0	102.8
National	% Change from 2015 BAU				-0.2%	-0.1%	0.0%	0.0%	0.0%	-0.4%	-0.2%	-4.0%	-3.2%	-7.0%	-7.4%
	Index to 2007	100	0.0	112.7	112.4	112.5	112.7	112.7	112.7	112.3	112.5	108.1	109.0	104.7	104.3

Business as usual

Background

Regional and local models are primarily established to replicate current conditions and to forecast BAU conditions. These 'platforms' allow future transport system and network improvement options to be tested in operational performance and economic appraisal terms.

Modellers and planners in each region or local area, have a pretty good idea of what they anticipate will be achieved over a 10-year period and therefore what a future BAU scenario is likely to consist of.

In most circumstances¹ the BAU to 2015 represents: the current RLTS, the LTCCP and the LTP. The BAU has been modelled in all four of the locations used in the SRM.

Regional and local models are relatively good at predicting BAU, and are less good at predicting demand responses to future policy or price-based changes. This is simply because these models were not constructed with this purpose in mind.

BAU forecasts, on the basis of planned expenditure, anticipated funding and a continuation of current practice and policy settings, can be regarded as relatively reliable outputs from regional and local models.

These BAU forecasts tend to assume a stable long-term oil price, and demand levels may vary from BAU if there is a significant variation in future oil price.

Apart from the oil price, the most significant contributors to future BAU scenarios are: current demand levels, population growth, land-use change and car ownership forecasts, all of which combine to produce expected future demand levels.

In general, the population forecasts used in regional and local models are consistent with Statistics NZ medium forecasts, unless specific and better information is available. Land-use changes are mainly derived from district plans or specific growth strategy studies. Car ownership is sometimes estimated simply (via projections of past trends into the future) or it can be derived from a separate car ownership forecasting 'model'.

In the future BAU scenario, road network changes are generally assumed to keep pace with land use changes as network planning opens up new areas for development and also responds to the most significant traffic 'bottle-necks' in the system. Sometimes there is a slight optimism bias in future BAU scenario selection, in terms of more resources being anticipated for network improvements than is likely in practice. Typically, future BAU scenarios produce better network conditions (in terms of average speed and travel cost for example) than either 'do nothing' or 'do minimum' future scenarios, but relatively poorer conditions than those experienced in the base year.

It should be remembered that a (generally) free at the point of use road network, a permissive land-use planning approach together with a supportive road capacity expansion policy, represents a 'predict and provide' approach to demand planning.

All of the above means that the exact assumptions used to construct future BAU modelled scenarios are not particularly relevant. The main point here is that future BAU conditions represent the scenario that local planners are striving for and expect to create.

¹ This will be the case providing the RLTS is realistic in terms of taking account of the funding likely to be available.

The most accurate regional and local modelled forecasts are likely to relate to vehicle travel and more specifically to total vehicle kilometres travelled (VKT). The modelling detail involved in surveying and modelling private vehicle passengers, walkers and cyclists and public transport passengers is much more variable. For example, the representation of walking and cycling activity on conventional transport models is not an easy task² and the resultant BAU forecasts therefore need to be treated with appropriate caution.

With the above qualifications, the 2015 future BAU scenario outline³ assumptions, used for the regional and local areas included in the policy modelling, were based on the following:

Auckland

Auckland RLTS (Scenario 5): medium TDM (\$420m), high PT (\$3,750m), medium roading (\$6540m). A 'base' roading figure is quoted in the 2005 Auckland Regional Land Transport Strategy (ARLTS) of \$5800m, around half of which is for maintenance, traffic management and safety, with the remainder allocated to selected new projects (most of which are already understood to have obtained funding approval and so could be described more accurately as representing a do-minimum scenario). The total funding expected to be available at the time was \$10,990m.

The ARLTS is not permitted (see the Land Transport Management Act) to name all of the projects used in compiling the strategy.

The BAU represents approximately 50% of the potential⁴ schemes to increase road capacity for general traffic but there is no particular significance in this figure.

Since 2005, additional funding has been allocated to the Auckland region for transport purposes, through the Joint Officials Group on Auckland Transport (JOG) and Auckland Transport Strategic Alignment Project (ATSAP) initiatives. The net result of this is likely to improve BAU outcomes (compared with those predicted from the 2005 RLTS modelling) particularly in terms of public transport patronage by 2015.

Christchurch

The background context to the modelled BAU is the Canterbury RLTS (2005–2015) This estimates a 10-year total transport expenditure of \$2375m, of this total PT and cycling amounted to \$375m, and roading to \$1500m. Note: All figures are approximate. Since this time additional resources of \$200m+ have been allocated to Canterbury by the Ministry of Transport, the Greater Christchurch Urban Development Strategy has been undertaken and a new RLTS has been published. None of these is expected to significantly affect the future BAU scenario in terms of VKT forecasts or the outcomes arising from these. One reason for this is that Christchurch has developed a long-term (25-year) road plan which underpins the 10-year RLTS and other strategies.

Future service level improvements and extension of bus priority systems are expected to result in higher PT patronage forecasts than those forecast under BAU (which have been factored by population forecasts).

² This is partly due to the availability of reliable data and the localised nature of walking and cycling, much of which is intra-zonal. One outcome of this is the tendency of regional and local models to predict increases in walking and cycling activity (due to planned investments) from a base year demand level, in contrast to the long-term trend of declining walking and cycling activity levels.

³ Further detail on the assumptions used in the BAU scenarios is available on request.

⁴ In other words, those identified during the ARLTS process as being potentially of value.

The RLTS does not contain details of the projects included in the preferred scenario.

Wellington

Wellington RLTS (preferred scenario) from the regional programme 2006/7 to 2015/16 is PT and TDM \$1330m (including maintenance) costs over 10 years (+\$495m costs beyond 10 years), and roading \$2753m (excluding maintenance) costs over 10 years (+\$1018m costs beyond 10 years).

The detailed proposals that make up the RLTS preferred scenario are included in the (informal) regional land transport programme published at the same time as the RLTS. The most significant expenditure in this programme relates to roading: Transmission Gully Motorway (TGM) \$1250m, Basin–Airport capacity \$250m, Grenada–Gracefield (\$240m); PT and TDM: rail rolling stock (\$423m), rail double-tracking (\$334m). The other items in the programme appear to be relatively minor or relate to operational and/or maintenance issues. Not all of the effects of this programme will be felt at the end of the 10-year RLTS programme. This is because some of the major projects, particularly TGM, Grenada–Gracefield, and Pukera Bay to Paekakariki double-tracking, are not expected to be fully completed within the period.

Since 2006, additional funding has been allocated to the Wellington region for transport purposes, through the JOG initiatives and integrated ticketing implementation is also in process. The net result of this is likely to improve BAU outcomes (compared with those predicted from the 2006 RLTS modelling) particularly in terms of public transport patronage by 2015.

Dunedin

The background context to the modelled BAU is the Otago RLTS (2005–2015). This estimated a 10-year total transport allocation from the NLTP of \$892m. Of this total, PT and TDM amounted to \$14m, and roading to \$723m. In addition, additional required expenditure of \$133m (on new initiatives) was identified. Note: All figures are approximate. Since this time additional resources have been allocated to Otago and a revised LTCCP and land transport programme have been prepared for Dunedin.

The number of households and school/tertiary rolls and jobs were factored according to projected household growth. The number of jobs was determined from a recent study of growth in Dunedin.

The future network was adjusted to include Harbourside Arterial, Centre to Carncross link, the Caversham motorway upgrade and the future public transport improvement package for Dunedin.

Strategy review model

Background

Simplified transport demand models emphasise the use of simpler model features in order to supplement the information and capability of existing models (Ortuzar and Willumsen 2001). A number of such models have been developed internationally, for example, the transport policy model and strategic transport model, both developed by the United Kingdom Transport Research Laboratory.

A simplified transport demand model has been developed in NZ for central policy and strategy assessment purposes, called the strategy review model (SRM). The model relies on outputs from four stage transport models, together with selected other data sources, to undertake policy and strategy tests for modelled areas and also to compile aggregate effects at the national scale. By building on the capability of existing models, SRM can be said to represent ‘fifth stage’ modelling for policy and strategy development purposes.

SRM is based on elasticities, cross elasticities, diversion rates and impact factors, derived from empirical analysis, studies and literature. The model is still in active development mode to improve the representation of current and future conditions. However, following an initial peer review (Willumsen 2008) SRM has been used to provide sensitivity test information for various purposes as follows:

- national and regional scale forecasts of *Government policy statement* (GPS) targets for the regional transport targets research
- background national and regional scale forecasts for New Zealand Transport Strategy development purposes
- regional and local area policy option testing for strategy assessment
- corridor travel planning policy option testing for package assessment.

The model covers the years 2007, 2015, 2025 and 2040 and is designed to test the likely impact of different combinations of various factors, including:

- public transport service levels and fares
- changes in private vehicle costs (including those related to road pricing and road building)
- oil prices
- local strategies, such as TDM.

In the short term, without making use of simplified demand models, it is very difficult to see how strategic transport policy and strategy development in NZ can be adequately informed and tested.

SRM application for regional transport targets purposes

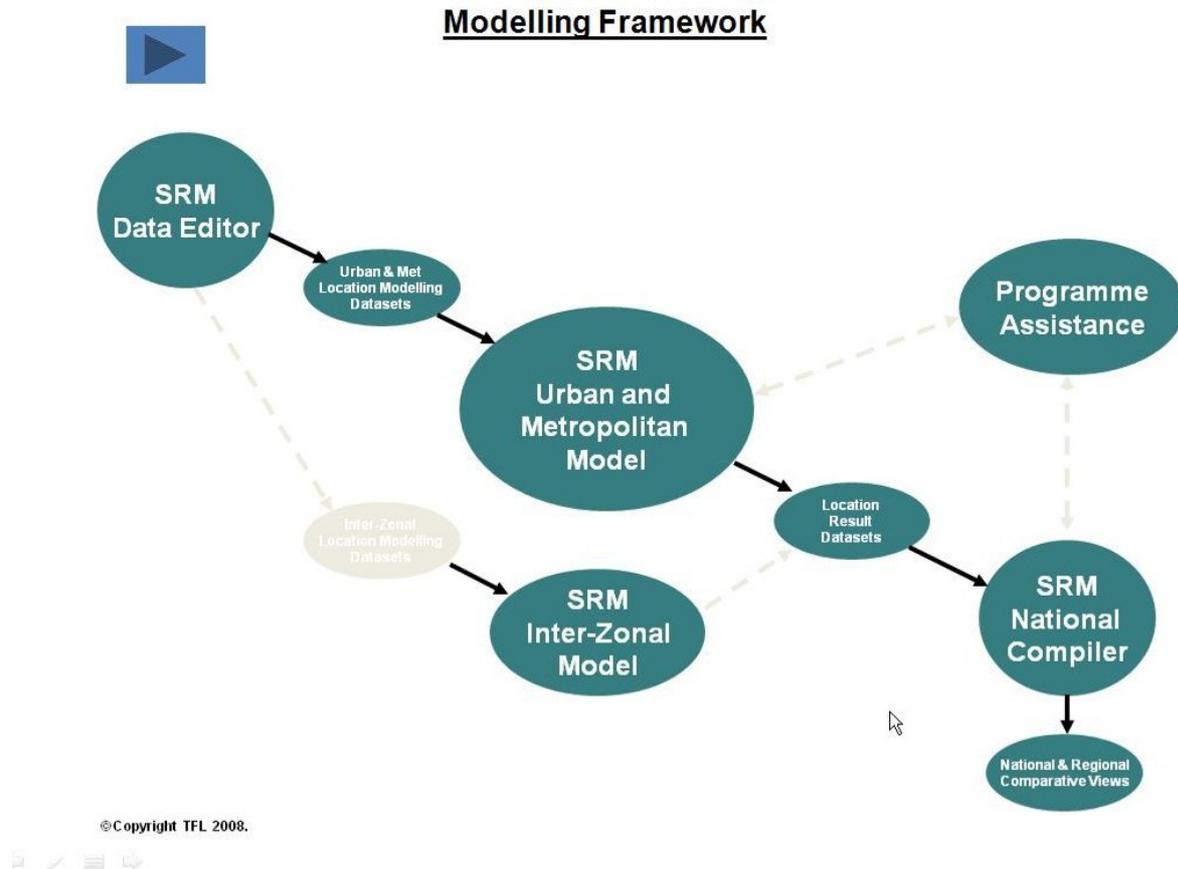
A number of improvements and adjustments were made to the SRM model prior to and during the course of the regional transport targets work, as follows:

- creation of the national compiler capability to produce national forecasts
- creation of a forecasting capability for 2025
- improvement of scenario building capability, especially in terms of targeted strategies (high occupancy vehicle, intelligent transport systems and traffic management strategies)
- response to peer review comments especially in terms of adopting more conservative elasticity values and to minimise the use of cross elasticities
- further verification of data
- further calibration of supporting analysis and forecasting.

Outputs

In addition to this report, a similar report for 2040 has been prepared, as well as presentation material explaining the model structure (see the figure on the next page) and background papers describing the detailed working assumptions used.

Working versions of the SRM model have been supplied to the NZTA and further versions are available on request.



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Appendix F: Monitoring regional transport targets

Context

The original Request for Proposal stipulated that the project report discuss 'How the regional targets could be monitored and progress tracked over time'; and make recommendations on 'which [targets] at national and regional level have existing monitoring regimes that will allow progress to be monitored, and which require additional data gathering frameworks to be established'.

Monitoring is clearly an important component of the project, in order to track progress towards achieving the designated targets and to prompt 'corrective' action where required. Our assessment of monitoring included:

- a review of existing monitoring regimes and data sources including:
 - NZ Transport Agency (NZTA) monitoring, particularly with respect to public transport usage
 - Ministry of Transport (MoT) monitoring work, particularly relating to the transport monitoring indicator framework, the walking and cycling monitoring framework and the Ongoing Household Travel Survey
 - regional council monitoring work, in particular that undertaken for the annual RLTS monitoring reports
- development of requirements for monitoring of the targets
- 'gap analysis', comparing monitoring requirements with current monitoring regimes.

In light of this analysis, we have developed recommendations (at a broad rather than detailed level) for enhancements/ additions to existing monitoring systems, in order to monitor future progress against the targets.

This discussion is at a high level, to monitor the achievement of the target, as opposed to monitoring the impacts of specific programmes or initiatives. Guidance for monitoring the impacts of specific travel demand management programmes/initiatives can be found in the *Travel behaviour change guidance handbook* (Land Transport NZ and EECA 2004).

Existing monitoring of selected GPS targets and potential improvements

Public transport (PT) patronage

Government policy statement (GPS) target

Increase PT patronage by 3% pa 2006/07 to 2014/15.

Target specification

- relates to public transport travel throughout New Zealand (ie not confined to MUAs)
- based on total passenger boardings
- **excludes:**

- total mobility
- Ministry of Education free school travel
- long-distance/inter-regional services
- **includes** – anything contracted by the regional councils, including:
 - those school services contracted by the regions
 - commercial services
 - Super Gold Card travel (free off-peak travel by people aged 65+).
- **PT target** relates to – trip ‘legs’, total, national basis.

Existing measurement and monitoring

- data from NZTA database (total PT boardings) on a regional basis
- inherent weakness: commercial services are sometimes (1) not included or (2) estimated in the regional council reporting of PT boardings to the NZTA.

Suggested improvements

Potential improvements include:

- while the regionalised GPS target applies across the entire region (ie it is not specifically limited to main urban areas (MUAs)), it is probably most helpful to the regions if the data is collected by MUA, for the purposes of ‘realistic’ comparison and creating an understanding of patronage trends that provides insight into what actions might be taken to boost patronage
- clarification of the catchment area population base: there are discrepancies between the base used by regional councils and that of Statistics New Zealand
- collection of full information for commercial services, as is required for contracted services. This can be requested through the Public Transport Management Act, but it is not clear if NZTA can publish the information submitted.

Walking and cycling

GPS target

Increase number of walking and cycling trips by 1% per year through to 2014/15.

Target specification

- walking and cycling share of total trip legs by people aged five and over on a national basis (not MUAs)
- a ‘trip leg’ is a surveying unit of non-stop travel by a single mode for a single purpose. For example, walking to work with a stop at the shop is two trip legs
- ‘walk’ includes walkers, joggers, skateboarders, children in pushchairs and people using wheelchairs or mobility scooters
- ‘cycle’ excludes mopeds and children’s tricycles.

Existing monitoring

- drawn from on-going New Zealand Household Travel Survey (ONZHTS) data
- four-year baseline (03/04–06/07) used for regional figures

- annual updates available (on a four-year moving average).

Issues of measurement and suggested improvements

Confidence intervals and sample sizes

Measurement

The use of the ONZHTS datasets raises some statistical issues, especially at (small) regional levels as well as difficulties for the walking and cycling split.

The New Zealand Household Travel Survey was established as a continuous survey in 2003. Within the continuous survey, people in over 2200 households in 280 meshblocks⁷ throughout New Zealand are invited to participate in the survey each year. Every member normally resident in a household is then visited and interviewed about all of their travel for two consecutive days specified by the interviewer. Day one begins at 4 am and day two ends at 3.:59 a.m. A 'complete' dataset representing all of New Zealand is compiled every four years.⁸

The Ministry of Transport monitors the travel diary data on an ongoing basis and provides feedback to the contractor carrying out the interviewing. Despite this, the Ministry has found a small drop in reporting on day two of the trip diary. Around 52% of trip legs are recorded on day one rather than the 50% that would be expected in a two-day travel diary. In particular, short driving trips (less than 2km) appear to be slightly underreported on day two (L. Povey, pers comm, 7 January 2009).

The ONZHTS is New Zealand's central data set for the monitoring of transport-related activity (mode share, trip legs, kilometre travelled by various modes, time of trips, etc) due to the quality of data and its wide sampling base (essentially all of New Zealand's population). The ONZHTS also allows several different types of disaggregation (eg by age, gender, trip purpose, household type).

Regional disaggregation of walking and cycling, and even single occupancy vehicle kilometres travelled (SOV KT) or trip legs, is limited, however, because of the wide confidence intervals required where the sample size is insufficient. As precise estimates of confidence intervals for the ongoing household travel survey were not available at the time of this report, the problem is illustrated using confidence interval estimates published for the 1997/98 household travel survey (ie assuming that broadly similar confidence intervals will result when three to four years of ONZHTS are combined to give a comparable number of respondents).

While they are not, strictly speaking, relevant for the GPS targets on their own⁹, we use the example of cycling trip leg estimates as a dramatic illustration of the problem. Perhaps unsurprisingly, given their infrequency, the precision of cycling trip leg estimates is markedly less than walking trip leg estimates. The 95% confidence interval half-width is around 6% of the national estimate for millions of trip legs walked, but 15% for millions of trip legs cycled.

⁷ The meshblock is the smallest geographic unit for which statistical data is collected and processed by Statistics New Zealand. A meshblock is a defined geographic area, varying in size from part of a city block to large areas of rural land. Each meshblock abuts against another to form a network covering all of New Zealand (www2.stats.govt.nz).

⁸ Further detailed information about the ongoing survey can be obtained from the Ministry of Transport website www.transport.govt.nz/research/LatestResults/ Information about the 1997/98 NZHTS can be found at www.transport.govt.nz/research/aboutthe199798HouseholdTravelSurvey/

⁹ Despite this, several regions requested that the GPS target be disaggregated into separate walking and cycling components.

Precision is naturally worse at a regional level because of the smaller sample size. For example, the 95% confidence interval half-width for millions of trip legs cycled in the Otago region is around 50% of the estimate for millions of trip legs *by all modes* for the Otago region. The 95% confidence interval half-width for distance (100 km cycled) in the Otago region is also above 50% of the estimate for the Otago region.

While not nearly as dramatic, the confidence interval half-width for walking has similar issues with precision at a regional level, particularly for smaller regions where the sample size is quite small.

Suggested improvements

The statistical limitations of the ONZHTS for *regional* disaggregation of cycling trip leg information will not be overcome by proposed increases to the sample size for the survey in the next few years. Hence, for those regions wishing to monitor cycle trends independently of walking trends, we suggest that regional comparisons of cycling trends are probably best made using one or more of the indicators:

- % of adults cycling in the past month (and/or % of adults cycling in the past year)
- % of adults regularly cycling

for which graphs have been presented in the report. The use of this information permits individual regional councils to compare the trends both *within* their region (across different four-year aggregates) and *between* different regions. In addition, performance measures related to 'local use' of pedestrian and cyclist facilities could be developed by local governments to monitor cycling trends in their area.

Trip legs v trip chains

Measurement

Within the ONZHTS, data is collected and reported in the main datasets produced by the Ministry of Transport as a series of 'trip legs' made by individual respondents over a two-day travel period. A trip leg is defined by the Ministry as a 'surveying unit' of non-stop travel by a single mode for a single purpose'. For example, walking to work with a stop at the shop is two trip legs.

Suggested improvements

While useful for many purposes, trip legs have their limitations when considering walking and cycling transport modes. The value of this is evident when we consider the example of a major success in getting people to switch from driving cars to using public transport. As measured in trip legs, this will inevitably also increase the number of trip legs walked. However, that increase in walking may not represent a success for walking and cycling transport policy or initiatives. In this case, monitoring of walking and cycling transport might better be reflected by analysis of trip chains walked and cycled.

Other potential sources

Counts

Counts were recommended to MoT as part of its walking and cycling monitoring framework, as a local measure to monitor the use of pedestrian and cyclist facilities. However, counts could also be used to monitor the *trend* in walking and cycling activity at the regional level, provided a consistent methodology was employed. It is highly likely that trends established using counts would only be comparable across time within a region and not across several regions.

Issues such as where to count, how often, and what tools and approach to use, are being investigated as part of an ongoing NZTA work programme exploring methodologies for pedestrian and cycle counts.

Single occupancy vehicle kilometres travelled

GPS target

Reduce SOV KT/capita in major urban areas on weekdays by 10%.

Target specification

- trip distance (VKT) by single occupancy passenger vehicles
- main urban areas only
- weekdays only
- light four-wheel vehicles
- excludes business travel

Existing measurement and monitoring

As was the case for the walking/cycling GPS target, the primary data source used for measuring the SOV KT is the ONZHTS. The baseline 'reading' of the SOV KT was derived from the 2004–07 ONZHTS dataset, which is updated annually (on a four-year moving average). Single occupancy vehicles and their trip length are readily identified through a variable in the dataset which indicates how many people are travelling in a given vehicle. The type of vehicle is also identifiable as is the residential location of the respondent.

While the sample size of the ONZHTS of over 14,000 people for 2004–2007 dataset is excellent at the *national* level, statistical limitations were apparent in using the data to measure *trends between different years* or for *specific MUAs* within regions. Where the sample size was insufficient, we 'clustered' MUA locations for the analysis we did to calculate the impacts of the initiatives we considered. In effect we created eight MUA-regions:

- 1 Auckland (all western, northern, central, southern, plus Papakura)
- 2 Hamilton zone (including Cambridge and Te Awamutu zones)
- 3 North of North Island MUAs (Whangarei, Tauranga, Rotorua)
- 4 South of North Island MUAs (Gisborne, Napier–Hastings, New Plymouth, Wanganui, Palmerston North)
- 5 Wellington (four cities plus Kapiti zone)
- 6 Christchurch
- 7 Dunedin
- 8 Rest of South Island MUAs (Nelson, Invercargill)

In this way we could generate statistically meaningful results for driver VKT. Where necessary, we apportioned these results to individual regions (eg Northland and Waikato) on a regional MUA population basis.

In our calculations of VKT removed, we have excluded trucks, vans, taxis and motorcycles (the first three because of their commercial use and the latter due its small numbers in the database), leaving private passenger vehicles only in the analysis.

Issues with measurement

There are similar statistical issues to those discussed for the walking and cycling target in using the ONZHTS dataset for monitoring this target, particularly related to disaggregation at the (small) regional level and potentially with the confidence intervals associated with this.¹⁰ The method we used (clustering MUAs) to overcome the lack of sample size in some MUA-regions could mask differences between the MUAs themselves. Proposed increases in sample sizes for future years' data collection may address this.

Another issue identified during the course of this research is related to the definition of 'single occupancy vehicle'. Concern was expressed at the workshops we held that vehicle trips where the driver purpose of travel is (in ONZHTS terms) 'accompany someone else', eg activities like parents 'chauffeur' children to school or to an after-school activity (and then driving straight home) or one family member driving another to visit the doctor. The rationale is that in terms of purpose of travel, such trips are functioning for a single occupant. It is possible that an increase of parents driving their children to school could appear as a decline in single occupancy vehicle trips or kilometres travelled, when such trips could be relatively easily substituted with other modes, such as walking, cycling or public transport. This issue is currently being explored in another NZTA research project (*Kilometres travelled and vehicle occupancy in urban areas: improving evaluation and monitoring*).

Other potential sources

Census journey to work

The Census travel to work data has been commonly used to derive a mode share indicator by local government, despite the obvious limitations such as the possible effects of weather on Census day (eg if it rains there could be a significant impact on the number of people walking or cycling to work). In addition, the data is only provided for the journey to work and not all passenger vehicle travel, which is the focus of the GPS SOV KT target. Furthermore, the proportion of single occupant vehicles as part of the traffic stream can only be interpolated (the Census only reports the number of drivers and the number of passengers, rather than specifying how many people are in a given vehicle). It may be possible to add a question seeking such information to future Censuses, if that was deemed desirable.

These limitations, combined with the fact that the data is only collected on one day (albeit consistently on the same day), once every five years, suggests a dataset that is not conducive to regular monitoring of progress towards achieving the GPS targets. For this reason, we suggest using ONZHTS data, disaggregated to trip purpose as appropriate.

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¹⁰ Confidence intervals may not be an issue at all or may only be an issue for the smallest regions (with the smallest sample sizes), but until the Ministry of Transport has completed the work to establish them, it is an unknown.

